ARCTIC INDUSTRIAL ACTIVITIES COMPILATION
VOLUME 1
Beaufort Sea: Marine Dredging Activities 1959 to 1982

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1985

CANADIAN DATA REPORT OF HYDROGRAPHY AND OCEAN SCIENCES
NO. 32

-3939/

Canadian Data Report Of Hydrography and Ocean Sciences

Data reports provide a medium for the documentation and dissemination of data in a form directly useable by the scientific and engineering communities. Generally, the reports contain raw and/or analyzed data but will not contain interpretations of the data. Such compilations commonly will have been prepared in support of work related to the programs and interests of the Ocean Science and Surveys (OSS) sector of the Department of Fisheries and Oceans.

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Regional and headquarters establishments of Ocean Science and Surveys ceased publication of their various report series as of December 1981. A complete listing of these publications is published in the *Canadian Journal of Fisheries and Aquatic Sciences*, Volume 39: Index to Publications 1982. The current series, which begins with report number 1, was initiated in January 1982.

Rapport statistique canadien sur l'hydrographie et les sciences océaniques

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Les rapports statistiques sont produits à l'échelon régional, mais numérotés à l'échelon national. Les demandes de rapports seront satisfaites par l'établissement auteur dont le nom figure sur la couverture et la page du titre. Les rapports épuisés sont fournis contre rétribution par des agents commerciaux.

Les établissements des Sciences et levés océaniques dans les régions et à l'administration centrale ont cessé de publier leurs diverses séries de rapports en décembre 1981. Une liste complète de ces publications figure dans le volume 39, Index des publications 1982, du *Journal canadien des sciences halieutiques et aquatiques*. La série actuelle a commencé avec la publication du rapport numéro 1 en janvier 1982.

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by

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ABSTRACT

Taylor, D. A., M. G. Reed, B. D. Smiley, and G. S. Floyd. 1985. Arctic Industrial Activities Compilation: Volume 1; Beaufort Sea: Marine Dredging Activities 1959 to 1982. Can. Data Rep. Hydrogr. Ocean Sci. 32: (Vol. 1) 192p.

This volume is one of a group of catalogues designed to compile and summarize important descriptive details of selected industrial activities carried out in the offshore Canadian Arctic during the past two or three decades. For user convenience, the Arctic has been arbitrarily divided into seven geographical areas, incorporating where possible, major oceanographic regions. These seven areas coincide with those of a companion series, namely, the Arctic Data Compilation and Appraisal catalogues which describe historic oceanographic data (currents, hydrocarbons, whales -- to mention a few). The approach and format within and between these catalogues and series are intended to facilitate comparison among subjects and regions.

With such a large undertaking, it is not possible to provide all catalogues at once. Therefore, publications which are presently available in the series are indicated on the inside back cover of each volume.

Marine industrial development is ongoing, and further updates of these catalogue descriptions are planned. Readers are requested to submit corrections and additions by writing to the issuing establishment. Such revision will be incorporated into an interactive computer graphics and listing system, and custom reports and maps will be available upon request.

Key words: Canadian Arctic, marine industrial activities, catalogue, database.

RÉSUMÉ

Taylor, D. A., M. G. Reed, B. D. Smiley, and G. S. Floyd. 1985. Arctic Industrial Activities Compilation: Volume 1; Beaufort Sea: Marine Dredging Activities 1959 to 1982. Can. Data Rep. Hydrogr. Ocean Sci. 32: (Vol. 1) 192p.

Le présent volume fait partie d'une série de répertoires conçus pour la compilation et le résumé des importants détails descriptifs d'activités industrielles choisies effectuées dans les eaux hauturières canadiennes de l'Arctique au cours des deux ou trois dernières décennies. Pour faciliter l'utilisation de l'ouvrage, les auteurs ont divisé arbitrairement l'Arctique en sept zones géographiques incorporant, si possible, de grandes régions océanographiques. Ces sept zones coïncident avec celles d'une série associée, les Arctic Data Compilation and Appraisal catalogues, qui décrit les données océanographiques historiques (courants, hydrocarbures, baleines, etc.). L'approche et la présentation de ces répertoires et séries visent une comparaison facile entre les sujets et les régions.

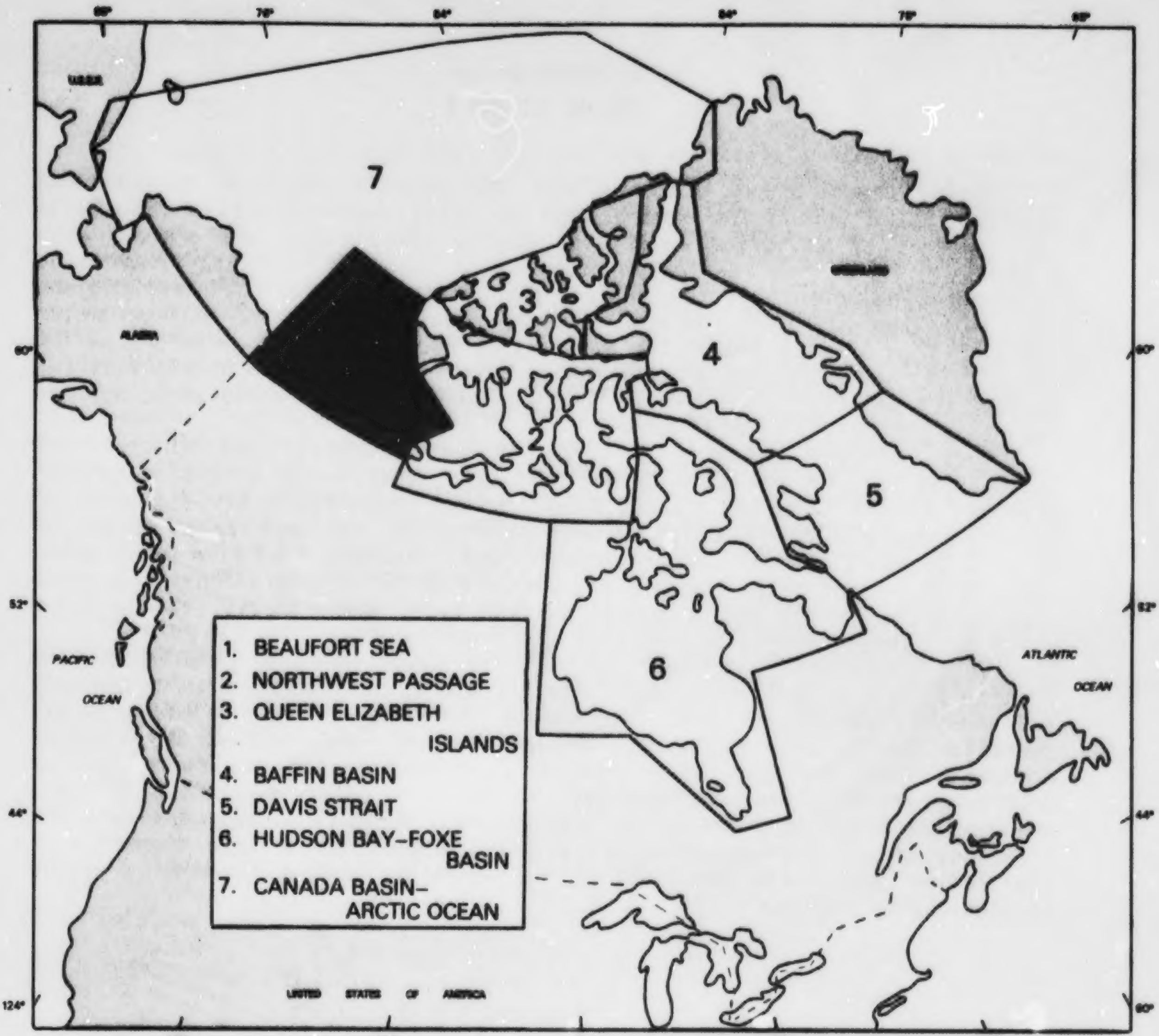
Il n'est pas possible de fournir tous les répertoires en même temps dans un

RÉSUMÉ
continued

travail de telle envergure. Les ouvrages de la série actuellement disponibles sont donc indiqués au plat du verso de chaque volume.

Le développement industriel du milieu marin est une activité permanente; on prévoit donc des mises à jour des répertoires. On demande aux lecteurs de faire parvenir leurs corrections et ajouts à l'établissement d'où provient la publication. De telles révisions seront ajoutées à un système interactif de listage et de traitement des données graphiques, des cartes et des rapports spéciaux seront disponibles sur demande.

Mots-clés: Arctique canadien, activités industrielles en milieu marin, répertoire, base de données.



This map shows the approximate study area covered by this volume, shown in relationship to other arbitrary areas in other volumes of this series, and also of the companion series, the Arctic Data Compilation and Appraisal catalogues for historic oceanographic measurements.

VOLUME ABSTRACT

Marine dredging has occurred over the past 25 years in the Canadian Beaufort Sea. During the period 1959 to 1982, approximately 46.5 million cubic metres of seabottom materials, mostly sand, clay, and gravel, were dredged by and for petroleum companies, communities, and government development agencies. Of the oil and gas companies operating in the Region, Dome Petroleum has been the most active, requiring about 22 million m^3 of dredging from 1976 to 1982. The majority of recorded dredging operations (95 out of 109) were associated with the construction of artificial islands for exploratory drilling (29.0 million m^3) and coastal harbours for anchorage and shorebase support (17.2 million m^3).

Most offshore dredging occurred in water depths less than 50 m. Tuktoyaktuk Harbour and McKinley Bay have been locations of extensive coastal dredging (1.7 million m^3 and 12.8 million m^3 respectively). The peak of annual dredging (95% of total volume) occurred in the open water months of July to October. Annual dredging requirements exceeded 4 million m^3 in years since 1976, principally because of accelerated oil exploration. The most common dredge in use was a cutter suction type, specifically, the Aquarius which has dredged 34% of all Beaufort Sea requirements.

This historical dredging overview is based on the compilation and archiving of over 100 individual dredging operations reported in government and industry records to 1982. A computer database was employed to organize operation details such as company, dredge type and name, purpose and dates of dredging, load and dump site locations, volumes loaded and dumped, water depths, sources of information, and so on. A complete listing of this dredging database is provided in this report. Computer-drawn maps show the locations of all past dredging operations. Appendices include summaries of legislation applicable to Beaufort Sea dredging and a Canadian dredging perspective by region.

ACKNOWLEDGEMENTS

The authors acknowledge the contributions and assistance given us during the research and preparation of this report. We offer special thanks to Rene Chave of Arctic Sciences Ltd. for developing and updating the computer database and maps. We are grateful to Sue Ball and Ron Pultke for their help in preparing the figures and drawings. Much appreciated advice and information were received from Sandy Sandilands, Larry Giovando, Dick Herlinveaux and Jim Vosburgh, all of the Institute of Ocean Sciences (IOS). Warren Fenton, of the Environmental Protection Service (EPS) in Yellowknife, Peter Wainwright, formally of EPS, Yellowknife and now a consultant in Nanaimo, B.C., and Alan Cornford of IOS were all instrumental in coordinating this report. Warren Fenton prepared the section on dredging legislation. The Canadian Hydrographic Service at IOS produced the photographs that appear within. Bill Livingstone of Gulf Canada Resources Inc., Daryl Butchko and Bruce Whitehouse of Esso Resources Canada Ltd., and Bill Lazenby and Ed Pessah of Dome Petroleum Ltd. were generous in providing details of company activities. Finally, the typing services of Avril Peters, Judy Pitcher, and Irene Sipila are greatly appreciated.

Funding for this work was made available through the Environmental Protection Service (EPS) in Yellowknife by the Panel on Energy Research and Development (PERD), the Institute of Ocean Sciences (IOS) in Sidney, the Career Oriented Student Employment Program (COSEP), and Northern Oil and Gas Action Plan (NOGAP).

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1. INTRODUCTION

Since the early 1960's, an increasing level of seabottom dredging activity has occurred in the southern Beaufort Sea, particularly around the mouth of the Mackenzie River during the open water season, and more recently further offshore, in water depths of 30 to 60 metres. Much of this marine dredging was commissioned by offshore oil and gas companies such as Dome Petroleum Ltd. (Dome), Esso Resources Canada Ltd. (Esso), and Gulf Canada Resources Ltd. (Gulf), for the construction of harbours and anchorages, breakwaters and piers, navigational channels, artificial islands for drilling, and glory holes for wellhead protection. Additional dredging has been required by local governments, principally for community landfill purposes.

Except for the more recent operations permitted under the Ocean Dumping Control Act, much of the past dredging information is scattered throughout the files and records of government regulatory agencies and oil and gas companies. This report, particularly the Operations Database and Dredging Overview sections, attempts to consolidate this information. It supplies detailed data on over one hundred marine dredging operations that occurred during the period 1959 to 1982 in the Beaufort Sea. Unfortunately, certain dredging operations are poorly documented since existing records are sometimes limited to single sentences or figures in government reports, dredge vessel records and letters. However, sufficient data is available to estimate annual and monthly total dredged volumes for the period 1972 to 1982. The data is organized in various formats and appears throughout this report as figures and tables. Table 1 offers a summary of Beaufort Sea dredging operations since 1959. Actual data listings appear in Section 4.

2. INFORMATION SEARCH

In May to August 1983, the two senior authors inventoried and compiled specific details on 109 Beaufort dredging operations conducted over the past 23 years (1959 to 1982). They spent a total of approximately 150 hours examining files, logs and other documentation kept in government and industry offices in Yellowknife, Calgary and Sidney. The principal agencies and companies involved and their types of records are listed in Table 2. The most important documents were dredge vessel logs, company internal correspondence, land leases and applications, dredging licenses, Ocean Dumping Control Act (ODCA) permits, government inspection reports, contractors' reports and monitoring studies. Examples of these documents are displayed in Figures 1 and 2. All dredging information was recorded on standard format sheets, for details such as company and dredge names, dates of operations, types of dredged material, volumes of sand or gravel, and water depths. In numerous cases, it was not possible to extract this level of detail from the existing documents and files. Telephone and personal interviews and mailed questionnaires were necessary to obtain this additional information from government and industry personnel directly involved in the specific dredging operations.

As part of this project, a computer database was designed and prepared using System 2000 management software. This task, together with the digitizing and plotting of dredging location maps, involved more than 250 hours of programming, data entry and revisions. The database and the System 2000 are described in Section 4.

In compiling the dredging information, certain gaps and errors became apparent. Some seemingly basic facts, such as a vessel name or type, were missing from government files or company records. Other operational details, such as type and amount of material dredged, were documented, but were inconsistent between files or records. The suspected sources of error and confusion are potentially many and varied, as follows:

Observer/instrument bias:

- poor knowledge of arctic geography;
- poor communication between contractors and companies;
- failure to attend to record details or to accurately transfer information between logs and reports;
- end-of-season haste by field personnel;
- inefficiencies due to weather (cold, darkness), isolation, and heavy seas;
- high staff turnover and inadequate training.

Record inconsistencies:

- differing regulatory requirements for report details, format, etc.;
- inconsistent enforcement of regulations by different government inspectors and between various agencies;
- poor scrutiny of industry reports by government agencies;
- inadequate training of regulatory personnel;
- little agreement on value of required information.

We alert the readers to these potential problems and caution against using details and values in this catalogue with full confidence. The Operations Database (Section 4) attempts to flag known or most obvious inconsistencies and gaps, generally in the Database instructions, but also, more specifically for each operation. However, the original source or party should be directly consulted for further verification of accuracy and precision as warranted by your intended applications of these details. Some information, such as specific borrow sites for gravel sources, was proprietry to particular companies and was, therefore, not available to be incorporated into the database. Further information and revisions to this catalogue are welcome. These should be sent to:

Department of Fisheries and Oceans
Ocean Information Division
Institute of Ocean Sciences
P.O. Box 6000
Sidney, B.C., Canada
V8L 4B2

Table 1. Annual volumes of Beaufort Sea dredging.

YEAR	PURPOSE	VOLUME DREDGED (M^3)
1959	Harbours etc.	91,359
1960	Harbours etc.	35,057
1961	Harbours etc.	8,607
1972	Artificial islands	304,000
1973	Artificial islands	322,800
1974	Artificial islands	507,592
1975	Artificial islands	421,540
1976	Artificial islands	3,129,344
	Harbours etc.	754,051
	Glory holes	18,519
1977	Artificial islands	2,685,000
	Harbours etc.	1,056,166
	Glory holes	18,519
1978	Artificial islands	0
	Harbours etc.	450,000
	Glory holes	55,557
1979	Artifical islands	4,331,620
	Harbours etc.	3,957,000
	Glory holes	18,519
1980	Artificial islands	1,939,065
	Harbours etc.	6,223,393
	Glory holes	18,519
1981	Artificial islands	6,175,282
	Harbours etc.	4,402,250
	Glory holes	10,000
	Other	7,040
1982	Artificial islands	9,212,407
	Harbours etc.	213,269
	Glory holes	106,619
	Other	60,706
	TOTAL	46,533,800

Table 2. Principal sources of historic dredging information.

Agency/Company Location	Information	Contacts/ Phone number
1. Canada Oil and Gas Lands Administration (COGLA)		
- Resource Evaluation Branch Ocean Mining Division, Ottawa, Ontario	-Dredge vessel specifications	Peter Hale (603) 993-3760
- Regional Office Yellowknife, N.W.T.	-Glory hole information	Morris Thomas (403) 920-8175
2. Department of Fisheries and Oceans (DFO)		
- Hydrographic Data Centre, Ottawa, Ontario	-Tuktoyaktuk Harbour bathymetry pre 1962	Russ McCall (613) 995-4661
- Technical Records Library, Ocean Information Division, Institute of Ocean Sciences, Sidney, B.C.	-Impact assessments -Monitoring studies -Contractor reports -Inspection reports -AWAC correspondence -COGLA Situation Reports and Weekly Reports	Brian Smiley (604) 656-8251 Dick Herlinveaux (604) 656-8268
3. Department of Indian Affairs & Northern Development (DIAND)		
- DIAND Lands, Yellowknife, N.W.T.	-Public Lands Grant Act leases, licenses and applications -Dredging Licenses	Floyd Adlem (403) 920-8165
- Land Management Division, Northern Renewable Resources Directorate, Ottawa, Ontario	-Dredgate material -Artificial island locations -Borrow sites -Authorized operating dates	Dale Longlitz (603) 997-0220 (also (403) 231-5874 in Calgary)

Table 2. Principal sources of historic dredging information. continued

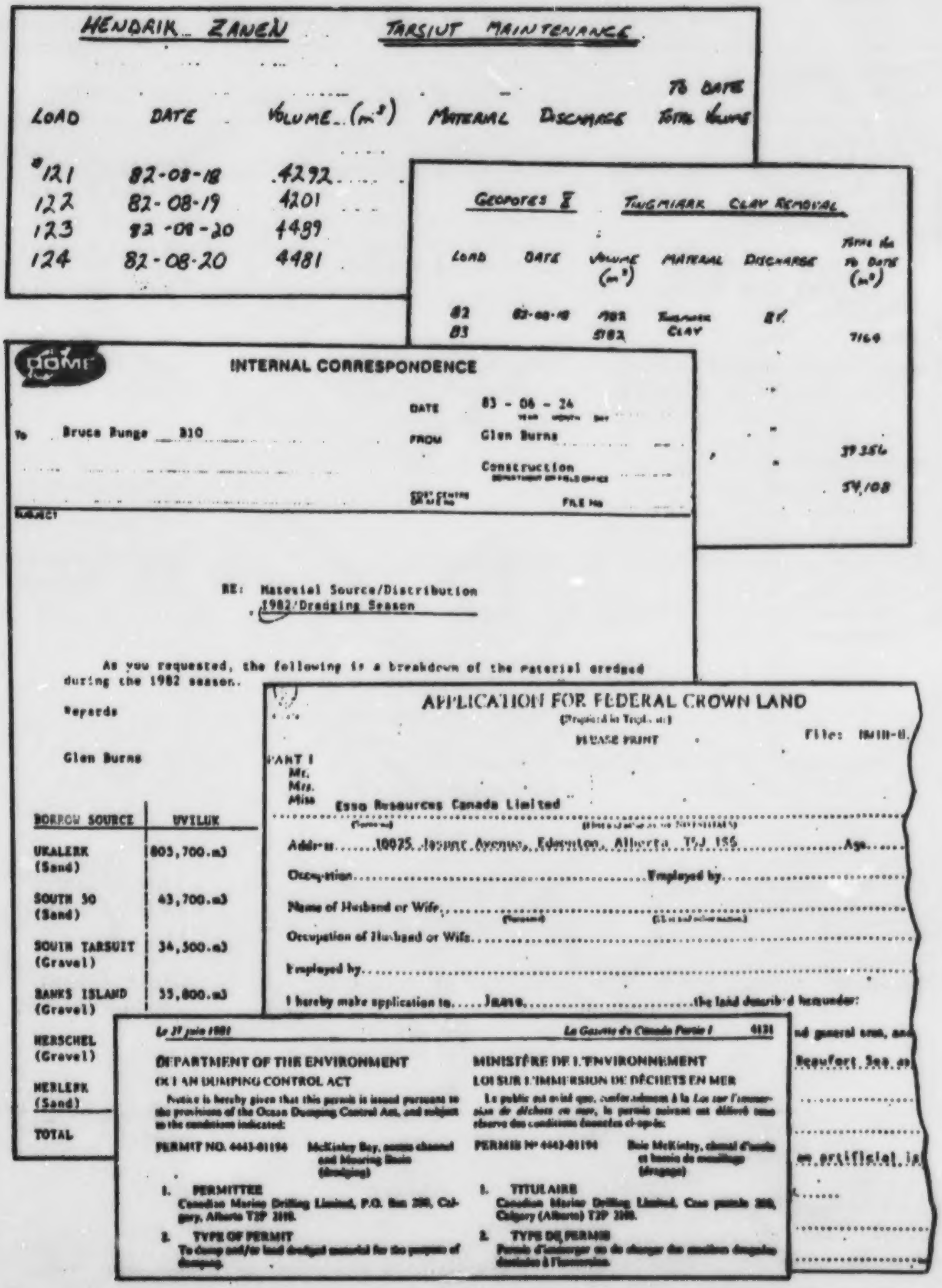
Agency/Company Location	Information	Contacts/ Phone number
4. Environment Canada Environmental Protection Service (EPS),		
- Pollution Control Directorate, Ottawa, Ontario	-Ocean Dumping Control Act Beaufort Database	Andree Chevrier (613) 997-3352
- District Office Yellowknife, N.W.T.	-Ocean Dumping Control Act permits and applications -Public Lands Grant Act leases, licenses and applications -Industry monitoring studies -Inspection reports	Warren Fenton (403) 873-3456
5. Government of Northwest Territories, (GNWT)		
- Department of Local Government, Yellowknife, N.W.T.	-Tuktoyaktuk community dredging	Bob Milburn (403) 873-7135
6. Public Works Canada		
- Marine Division Edmonton, Alberta	-Beaufort Sea operations by Department of Public Works, 1959-61	Chris Colp (403) 420-3204 Roy McLennan (403) 420-3235
7. Transport Canada		
- Canadian Coast Guard, Navigable Waters, Vancouver, B.C.	-Navigable Waters Protection Act	John Duduman (604) 661-3146

Table 2. Principal sources of historic dredging information. continued

Agency/Company Location	Information	Contacts Phone number
8. Dome Petroleum Ltd. Calgary, Alberta	-Artificial island construction -Borrow sites -Harbour, channel and mooring basin development and maintenance -Glory hole construction -Dredge vessel log books (daily/weekly operations)	Glen Burns (403) 260-8468 John Duff (403) 260-8247 Bill Lazenby (403) 260-8460 John Moorlag (403) 260-8439 Ed Pessah (403) 231-8054 Niel Vanalstine (403) 231-5313 John Ward (403) 231-3866
9. Esso Resources Canada Ltd., Calgary, Alberta	-Artificial island construction -Dredge vessel log books (daily/weekly operations -Borrow sites -Harbour, channel and mooring basin development and maintenance	Dave Bertram (403) 237-2231 Helmut Bock (403) 237-2252 Daryl Butchko (403) 237-2249 Jim Butler (403) 237-2120 Malcolm Comyn (403) 239-2419 Steve Fitzmauric (403) 237-2106 Mark Psutka (403) 237-2106 Bruce Whitehouse (403) 237-2171
10. Gulf Canada Resources Inc., Calgary, Alberta	-Dredge vessel log books (daily/weekly operations) -Glory hole construction -Future dredging plans	Bill Livingstone (403) 233-5481 Jim McComiskey (403) 233-5253 Bob Morrison (403) 233-2892

Table 2. Principal sources of historic dredging information. continued

Agency/Company Location	Information	Contacts Phone number
11.Shell Canada Resources Ltd., Calgary, Alberta	-Beaufort operations prior to 1972	Ken Simpson (403) 232-3111
12.Arctic Laboratories Ltd., Sidney, B.C.	-Monitoring studies	Dave Thomas (604) 656-7077
13.Beaver Dredging Co. Ltd., Calgary, Alberta	-Dredge vessel specifications	John Waring (403) 237-8676
14.Northern Construction Ltd., Vancouver, B.C.	-Dredge vessel specifications	Orvil Dyer (604) 685-4535
15.Peter Wainwright Nanaimo, B.C. (formally of Environment Protection Service, Yellowknife)	-Ocean Dumping Control Act permits and applications -Public Lands Grant Act leases, licenses and applications -Industry monitoring studies -Inspection reports	Peter Wainwright (604) 758-9890
16.Sceptre-Riedel-Dawson Construction Ltd., Vancouver, B.C.	-Dredge vessel specifications and operations	Bert Gill Ted Pilchak (604) 273-5521
17.Terra Surveys Ltd. Sidney, B.C.	-Artificial islands	Tony O'Connor (604) 656-0931
18.Volker Stevin Dredging and Service Canada Ltd. Calgary, Alberta	-Artificial island construction -Dredge vessel specifications and operations	Joost Brakel (403) 234-7890



HENDRIK ZANEN TARSIUT MAINTENANCE

LOAD	DATE	VOLUME (m³)	MATERIAL	DISCHARGE	TO DATE TOTAL VOLUME
#121	82-08-18	4292			
122	82-08-19	4201			
123	82-08-20	4489			
124	82-08-20	4481			

GEOPOTES X TINGMIARK CLAY REMOVAL

LOAD	DATE	VOLUME (m³)	MATERIAL	DISCHARGE	TOTAL VOL TO DATE (m³)
82	82-08-18	1982	TINGMIARK CLAY	BT	
83		5182			7164
					39356
					54,108

DOME

INTERNAL CORRESPONDENCE

DATE 83 - 06 - 24

YEAR MONTH DAY

To Bruce Runge 310

FROM Glen Burns

Construction

DEPARTMENT OR FIELD OFFICE

COST CENTRE OR AFE No

FILE No

SUBJECT

RE: Material Source/Distribution 1982/Dredging Season

As you requested, the following is a breakdown of the material dredged during the 1982 season.

Regards

Glen Burns

BORROW SOURCE	UVILUK
UKALERK (Sand)	803,700.m3
SOUTH 30 (Sand)	43,700.m3
SOUTH TARSUIT (Gravel)	34,500.m3
BANKS ISLAND (Gravel)	35,800.m3
HERSCHEL (Gravel)	
HERLERK (Sand)	
TOTAL	

APPLICATION FOR FEDERAL CROWN LAND

(Prepared in Triplicate)

PLEASE PRINT

File: 1M10-8.

PART I

Mr.
Mrs.
Miss Esso Resources Canada Limited

(Surname) (Given name or names in full)

Address ......10025 Jasper Avenue, Edmonton, Alberta T5J 1S5 ....Age.....

Occupation ....Employed by ....

Name of Husband or Wife, ...

(Surname) (Given and other names)

Occupation of Husband or Wife ....

Employed by ....

I hereby make application to.....lease.........................the land described hereunder:

...nd general area, and

Beaufort Sea, ...

...an artificial is...

Le 27 juin 1981 *La Gazette du Canada Partie I* 4131

DEPARTMENT OF THE ENVIRONMENT

OCEAN DUMPING CONTROL ACT

Notice is hereby given that this permit is issued pursuant to the provisions of the Ocean Dumping Control Act, and subject to the conditions indicated:

PERMIT NO. 4443-01194 McKinley Bay, access channel and Mooring Basin (dredging)

1. PERMITTEE
Canadian Marine Drilling Limited, P.O. Box 200, Calgary, Alberta T2P 2H8.

2. TYPE OF PERMIT
To dump and/or load dredged material for the purpose of dumping.

MINISTÈRE DE L'ENVIRONNEMENT

LOI SUR L'IMMERSION DE DÉCHETS EN MER

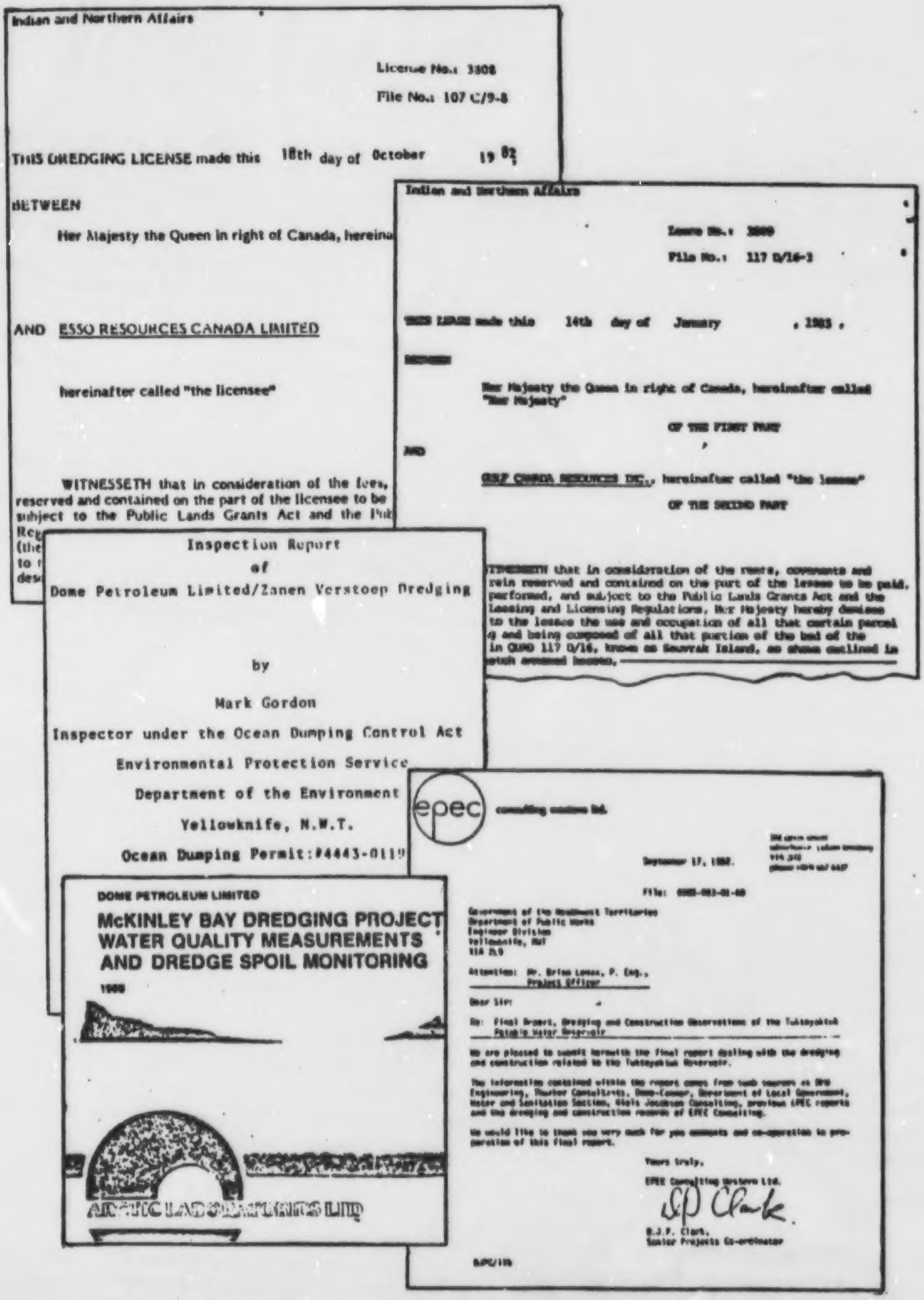
Le public est avisé que, conformément à la *Loi sur l'immersion de déchets en mer*, le permis suivant est délivré sous réserve des conditions énoncées ci-après:

PERMIS Nº 4443-01194 Baie McKinley, chenal d'accès et bassin de mouillage (dragage)

1. TITULAIRE
Canadian Marine Drilling Limited, Case postale 200, Calgary (Alberta) T2P 2H8.

2. TYPE DE PERMIS
Permis d'immerger ou de charger des matières draguées destinées à l'immersion.

Figure 1. Information sources: Ship logs, Internal Correspondence, Lease Application, ODCA Permit.



Indian and Northern Affairs

License No.: 3808

File No.: 107 C/9-8

THIS DREDGING LICENSE made this 18th day of October 19 82

BETWEEN

Her Majesty the Queen in right of Canada, hereina

AND ESSO RESOURCES CANADA LIMITED

hereinafter called "the licensee"

WITNESSETH that in consideration of the fees, reserved and contained on the part of the licensee to be subject to the Public Lands Grants Act and the Pub

Indian and Northern Affairs

Inspection Report

of

Dome Petroleum Limited/Zanen Verstoep Dredging

by

Mark Gordon

Inspector under the Ocean Dumping Control Act

Environmental Protection Service

Department of the Environment

Yellowknife, N.W.T.

Ocean Dumping Permit:P4443-0119

DOME PETROLEUM LIMITED

McKINLEY BAY DREDGING PROJECT WATER QUALITY MEASUREMENTS AND DREDGE SPOIL MONITORING

1980

Figure 2. Information sources: PGLA License, PGLA Land Lease, Inspection Report, Contractor Report, Monitoring Study.

3. DREDGING OVERVIEW

3.1 Dredging operations and requirements

Dredging, the loading and subsequent disposal or placement of spoils, is required for offshore oil and gas exploration in the Beaufort Sea, and will continue to be associated with future production and shipment. At present, dredging is necessary to:

(1) construct and maintain harbours and approaches of appropriate depth and configuration to accommodate present and future marine fleet;

(2) provide materials used in the construction of artificial islands (foundation pads, berms and relief well spurs) for offshore platforms, and ballast for caisson platforms;

(3) excavate glory holes at wellsites for drilling from conventional drill-ships and conical drilling units in less than 54 metres of water;

(4) provide ice-scour protection required for production trees, subsea pipelines and other possible seafloor systems;

(5) provide material used for landfills and land reclamation.

These purposes are described in detail in this Dredging Overview. One purpose not considered here is that of dredging to dismantle abandoned islands. The abandonment of sacrificial beach artificial islands requires the removal of all anthropogenic materials such as filter-cloth, sandbags and slope protection. As such materials are covered by sand through slumping and erosion processes, Esso's island clean-up program has typically involved a clamshell crane mounted on a spud barge to recover the buried materials. For regulatory purposes, this operation is not considered as dredging. However, where such materials are below the shoreline, the process is analogous to dredging to remove an overburden. Information such as volumes and timing was not readily available due to differences in the regulatory process, and is not included in this report.

3.1.1 Harbour, channel and mooring basin construction and maintenance

Offshore exploration for oil and gas in the Beaufort Sea has necessitated the establishment of permanent support bases and harbours for Dome, Esso and Gulf. These companies have identified the following criteria for selecting support bases (Beaufort Sea/Mackenzie Delta Environmental Impact Statement Volume 2, 1982):

(1) good deep sea access;
(2) proximity to development areas;
(3) good access to the Mackenzie River system;
(4) capacity to receive medium- to long-range heavy aircraft;
(5) potential overland access by winter or permanent road;
(6) capability to fuel and service all types of marine traffic on a year round basis;

(7) adequate areas for large dock, storage and lay-up areas plus associated workshops, accommodations and support facilities;
(8) capability to handle deep draft vessels and drilling systems and aircraft larger than the jets in use in 1982.

Marine dredging activities are usually required to meet factors 1, 7 and 8 and may be involved in fulfilling items 3, 4, 5 and 6.

Suitable natural harbours are scarce in the Beaufort region, especially in the region of the Mackenzie River Delta where heavy silt loads, storm surges, and eroding coastlines are characteristic. There are few harbours with protection from winds and sea ice and with entrance passages of sufficient depth and width even for shallow draft vessels. To the east, Wise Bay on the Parry Peninsula is a good natural deep draft harbour (Figure 3). This Bay is presently used for mooring a refuelling tanker, but industry judges it too far from promising oil discoveries to serve as a permanent support base. To the west of the Mackenzie Delta, Pauline Cove on Herschel Island is another natural harbour, but it is too small for major installations and somewhat distant from the drilling sites. In 1977, the Advisory Committee on Northern Development recognized Tuktoyaktuk Harbour, Letty Harbour and King Point (Yukon Coast) as acceptable harbour sites. Thetis Bay (Herschel Island), Mason Bay (Richards Island) and McKinley Bay were also candidate sites, but were judged to have a high potential for environmental impact (Clarke, 1980) (Figure 3).

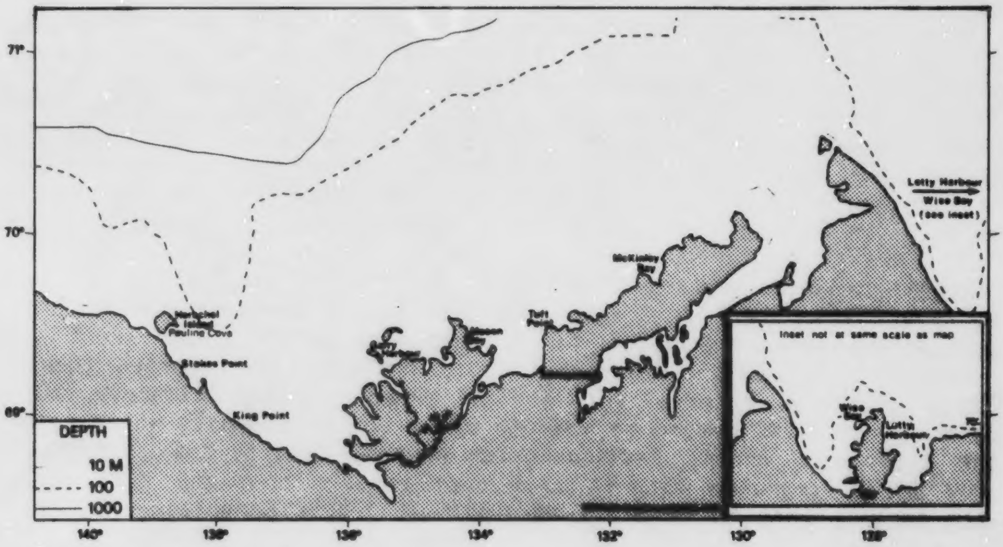


Figure 3. Present and potential harbours and support bases in the Beaufort Region.

Up to and including the winter of 1978-79, Dome/Canmar overwintered their drillships at temporary anchorages at Pauline Cove and Wise Bay. However, so that their drillships might move to drilling locations earlier in the spring and hence to lengthen the drilling season, the company decided to construct an overwintering basin at a location closer to the drilling leases and to the transition (unconsolidated) ice zone.

In June 1979, Dome/Canmar submitted an application to the federal government (Dome's initial application was rejected in 1975) to obtain the necessary permits for dredging this new access channel and vessel mooring basin in McKinley Bay and also for dredging a deeper approach channel to Tuktoyaktuk Harbour. In September, approval was granted for both programs and within a few weeks the dredge vessel Aquarius excavated nearly 3.5 million m^3 of material for the channel and basin in McKinley Bay (Pessah, 1982; Letter from Prather, Dome, to Bryant, EPS Yellowknife, 12/12/79). In 1980 the Aquarius worked in Tuktoyaktuk Harbour, deepening the approach channel by dredging over 350,000 m^3 of substrate material (Pessah, 1982). Further dredging at McKinley Bay displaced 5.5 million m^3, extending the channel and mooring basin and creating a protective artificial island. In 1981 and 1982 the basin expansion operations were continued in McKinley Bay.

During the years 1976 to 1982, Esso used an embayment near Tuft Point (Tuktoyaktuk Peninsula) as a staging area, an overwintering site, and a borrow source for construction sand. In 1976, the dredge vessel Beaver Mackenzie constructed a 770,000 m^3 breakwater at Tuft Point in order to increase wave and ice protection to subsequent dredging operations. An additional 2 million m^3 of sand and gravel was dredged through 1977-79 for this breakwater's reinforcement and maintenance (Dredging license application from Shaw, Esso, to Dunlop, DIAND, 07/04/83; Letter from Bennett, Esso, to Redshaw, DIAND, 04/14/83; Imperial Oil Ltd., 1977). Esso discontinued operations at Tuft Point in 1980 but returned in 1982-83 to reconstruct the breakwater for caisson assembly activities. In 1981 and 1982, Esso dredged over 250,000 m^3 of material in Tuktoyaktuk Harbour for a land reclamation project.

Other companies and agencies have also dredged in Tuktoyaktuk Harbour. As early as 1959, the Federal Department of Public Works started a three year program of maintenance dredging for navigational safety at different sites in the harbour. In 1979, the Government of Northwest Territories (GNWT) used 80,000 m^3 of dredge material for landfill purposes. Approximately 750,000 m^3 of material was also needed in 1981 to construct a community water reservoir. In the same year, Arctic Transportation Company Limited (ATCL) dredged over 250,000 m^3 of granular material for dock construction and fill operations (Letter from Sproule to Adlem, DIAND, 04/08/82; EPEC Consulting Western Ltd., 1982; Haist and Milburn, 1980; Thurber Consultants Ltd., 1979).

At present, Tuktoyaktuk Harbour is the primary support and supply centre for offshore exploration in the Beaufort region. McKinley Bay serves as a winter anchorage and forward supply point for early and late season drilling activities. The McKinley Bay protection island now permits some ship repair and storage/accommodation for exploration. Tuft Point provides a caisson assembly site. Wise Bay, Summers Harbour and Pauline Cove continue to be used intermittently as anchorages and/or marine staging areas.

Future projections of industry include Tuktoyaktuk Harbour and McKinley Bay as essential harbours, requiring some expansion and continued maintenance. In addition, to accommodate present and projected levels of activities, industry may require a third, and possibly a fourth, harbour. Dome, Esso and Gulf have stated that one or two sites on the Yukon Coast would be optimum for the next Beaufort Sea harbour and shorebase (Beaufort Sea/Mackenzie Delta Environmental Impact Statement, Volume 2, 1982). Nearby Pauline Cove would continue as a staging area and temporary anchorage for exploration and development activities on western leases of the Mackenzie Shelf. Considerable dredging will be required to construct and maintain such artificial harbours and their approach channels. Annual dredging will also be necessary to maintain safe navigational waters in McKinley Bay and Tuktoyaktuk Harbour, and their approach channels.

Table 3 summarizes dredging operations for harbours since 1976, the earliest year that such activities were recorded.

Figures 4 to 7 summarize all known Beaufort Sea dredging operations for the construction and maintenance of harbours, approach channels, and mooring basins.

Table 3. Total volume dredged (m^3) by month and year for harbours, channels, mooring basins 1976 to 1982.

YEAR	LOCATION	JUNE	JULY	AUG	SEPT	OCT	NOV	MONTH UNKNOWN	ANNUAL TOTAL (m^3)
1976	McKinley Bay								
	Tuft Point		403,124					350,927	754,051
	Tuktoyaktuk								
1977	McKinley Bay								
	Tuft Point		729,996	219,159	70,845				1,020,000
	Tuktoyaktuk		36,135						36,135
1978	McKinley Bay								
	Tuft Point							450,000	450,000
	Tuktoyaktuk								
1979	McKinley Bay				1,925,000	1,502,000			3,427,000
	Tuft Point							450,000	450,000
	Tuktoyaktuk								
1980	McKinley Bay		2,331,153	2,329,013	1,199,849				5,860,015
	Tuft Point								
	Tuktoyaktuk					296,389	66,989		363,378
1981	McKinley Bay			836,736	1,394,559	1,255,105			3,486,400
	Tuft Point								
	Tuktoyaktuk	379,992	530,758					5,100	915,850
1982	McKinley Bay			23,978	4,534	14,157			42,669
	Tuft Point		22,900						22,900
	Tuktoyaktuk		138,700					9,000	147,700
MONTHLY TOTAL (m^3)		379,992	4,192,796	3,408,886	4,654,787	3,087,651	66,989	1,265,028	17,056,129

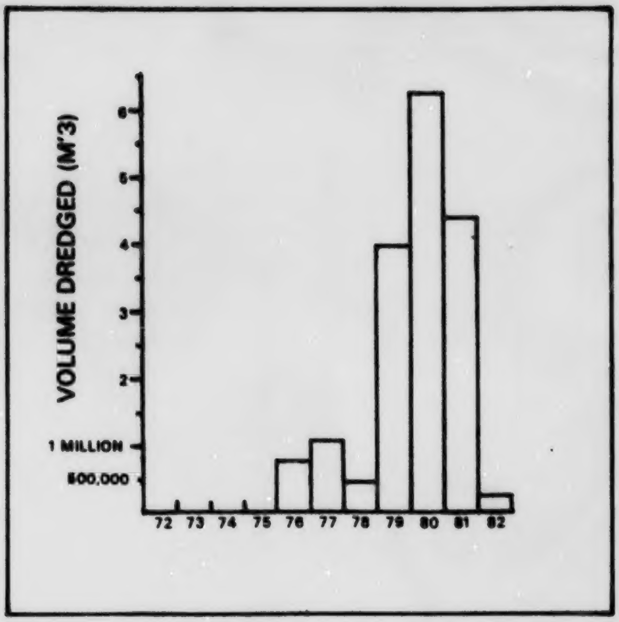


Figure 4. Total volumes dredged for harbours, channels and mooring basins per year 1972 to 1982.

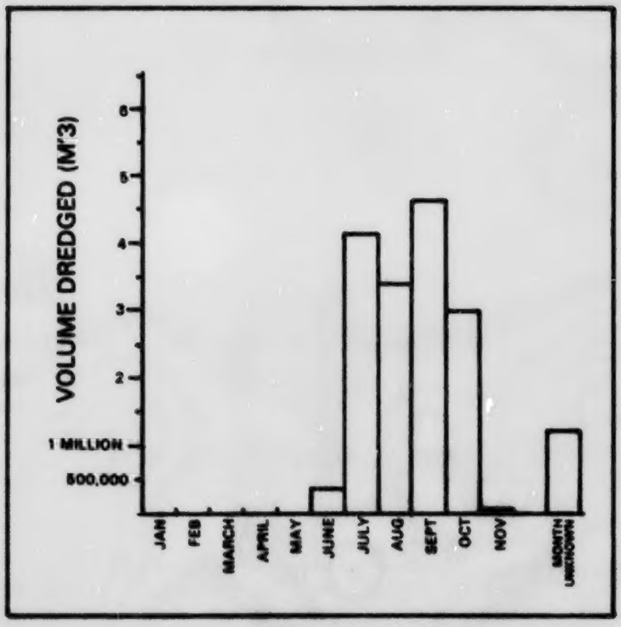


Figure 5. Total volumes dredged for harbours, channels and mooring basins per month 1972 to 1982.

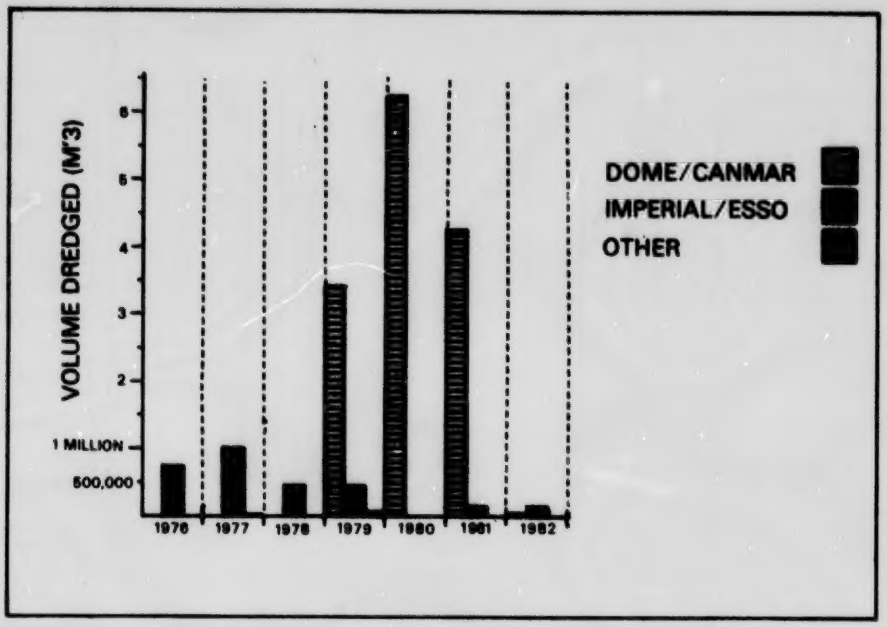


Figure 6. Volumes dredged by company/operator for harbours, channels and mooring basins 1976 to 1982.

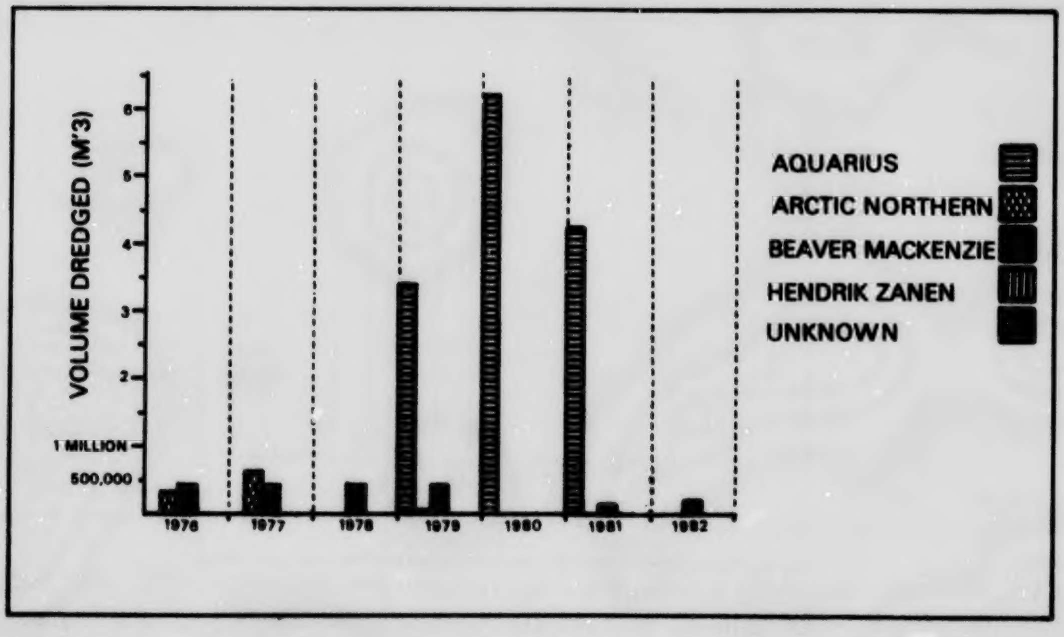


Figure 7. Volumes dredged by dredge vessel for harbours, channels and mooring basins 1976 to 1982.

3.1.2 Artificial island construction

Since 1972, industry has constructed offshore artificial islands in the Beaufort Sea to provide safe bottom-founded platforms for drilling, especially for winter operations. Esso has been most active in island construction, building 22 islands by 1982 in the nearshore region of the Mackenzie Shelf. Dome started to build offshore islands in 1980, in water depths greater than 20 metres, and has most recently been working at an island site in 45 metres of water. Between 1972 and 1977, companies constructed fifteen islands. Since then, the number of island platforms has declined to one per operator per year.

Island sites have been located progressively farther into deeper water, necessitating the employment of dredges using material from the sea bed. The distance a dredge must travel from a borrow site to an island location significantly affects the volume of dredging which can be accomplished each day (Figure 8). Although the number of dredges used in the Beaufort has increased from one in 1972 to the current seven, only four to five islands and two subsea berms have been built since 1979. This is due to the greater distance that a dredge must travel to obtain good construction material, to the increased volume of material that requires placement for deep water islands, the more difficult construction environments, and to various economic factors.

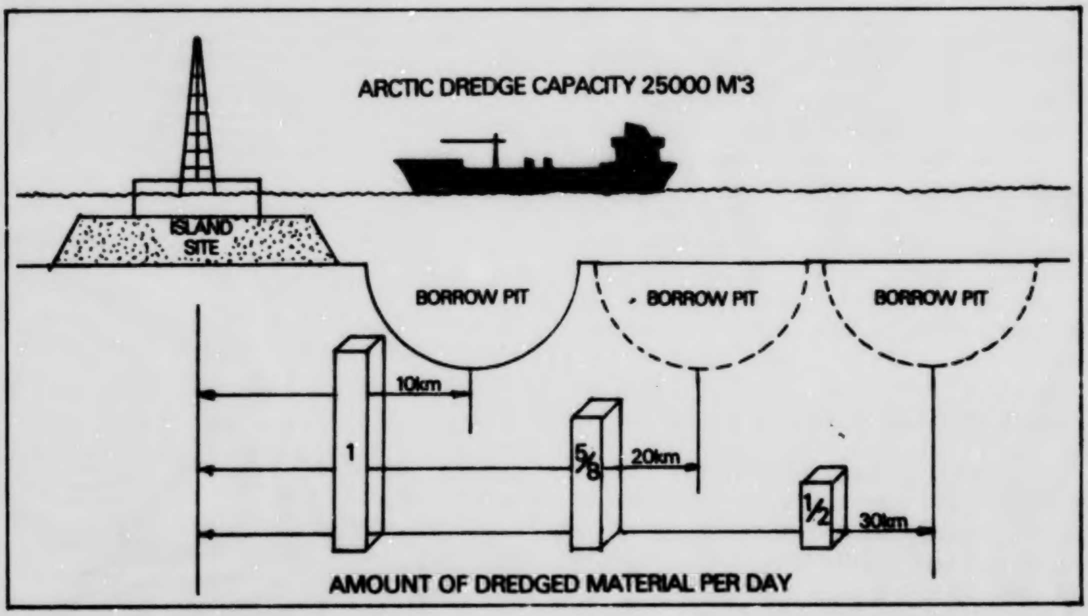

ARCTIC DREDGE CAPACITY 25000 M'3
ISLAND SITE
BORROW PIT
BORROW PIT
BORROW PIT
10km
1
5/8
20km
1/2
30km
AMOUNT OF DREDGED MATERIAL PER DAY

Figure 8. The daily capacity of an Arctic dredge is reduced by 50% when the borrow pit is 30 km from the construction site as compared to 10 km.
(Adapted from: Beaufort Sea/Mackenzie Delta Environmental Impact Statement, 1982, Volume 2, Fig. 4.3-26.)

Some of the first islands built by Esso were not constructed with marine dredging operations, but rather used trucked gravel from terrestrial sources such as Ya Ya Lakes in the Mackenzie Delta (Figure 3). The gravel was hauled over winter-fast ice and dumped into excavated holes in the ice. For subsequent islands constructed at sites where granular deposits were available nearby, a cutter suction dredge was used to pump fill through a floating pipeline to the site. When granular material could not be found locally, the companies hauled fill in barges or hopper dredges from other borrow areas, and placed it by bottom dumping scows or by pipeline discharge from the hopper dredges.

Several techniques are used to combat problems of island erosion. These include sandbags, gravel rip-rap, a sacrificial beach, and steel/concrete caissons. Most of the earlier islands used sandbags overlying filter cloth to protect the relatively steep (1:3), upper slopes of the island from wave and current erosion and to reduce the volume of fill required for construction. Immerk, the first sandbag-retained island, was constructed in 3.3 metres of water by Esso. During the period 1972 to 1975, eight islands were built, some in water depths up to 7.0 metres.

Industry changed building designs as it gained experience in offshore drilling and sought to explore in deeper waters. The sacrificial beach design was introduced in 1976 with the construction of Arnak L-30 and Kannerk G-42, and followed by Isserk E-27 in 1977, Issungnak O-61 in 1979, and Alerk P-23 in 1981. These types of islands are best suited to sites where sufficient quantity of suitable fill material is available close by. They are usually built in the open water season, from late July to early October, often using a high-volume, stationary dredge to excavate and place the material. Sacrificial beach islands are characterized by a long gradual "shoulder" (average slope of 1:12) around the drilling surface. During the open water season, these slopes allow storm waves to break and dissipate before they reach the drilling pad, eroding the beach but not the drilling surface. In winter, ice sheets bend and break on these slopes and consequently form a so-called "rubble field" around the island. Additional erosion protection to the islands' slope is often provided by sandbags and filter cloth on the beach and around the drilling surface (Figure 9).

Construction technology is now moving towards the use of platforms capable of operating year-round at greater depths and in more severe ice conditions. To minimize dredging and fill requirements at these depths and to reduce island erosion, the companies have developed various caisson-retained island designs. A caisson island is built by initially dredging a sand and gravel berm on the sea floor, reaching up to within 8 metres or so of the sea surface. The caisson, a ring-shaped steel or concrete structure of various sizes and shapes, is set on top of this berm. Dredges fill the caisson with sand to provide the actual platform for drilling, accommodations and storage.

In some berm constructions, clay bunds (embankments) are needed to retain the sand infill. These are dredged and precisely dumped with a trailing suction hopper dredge. The companies often use a second trailing suction hopper dredge to dredge sand and to infill within the retaining bunds.

The first caisson-retained island was built at Tarsiut, by Canadian

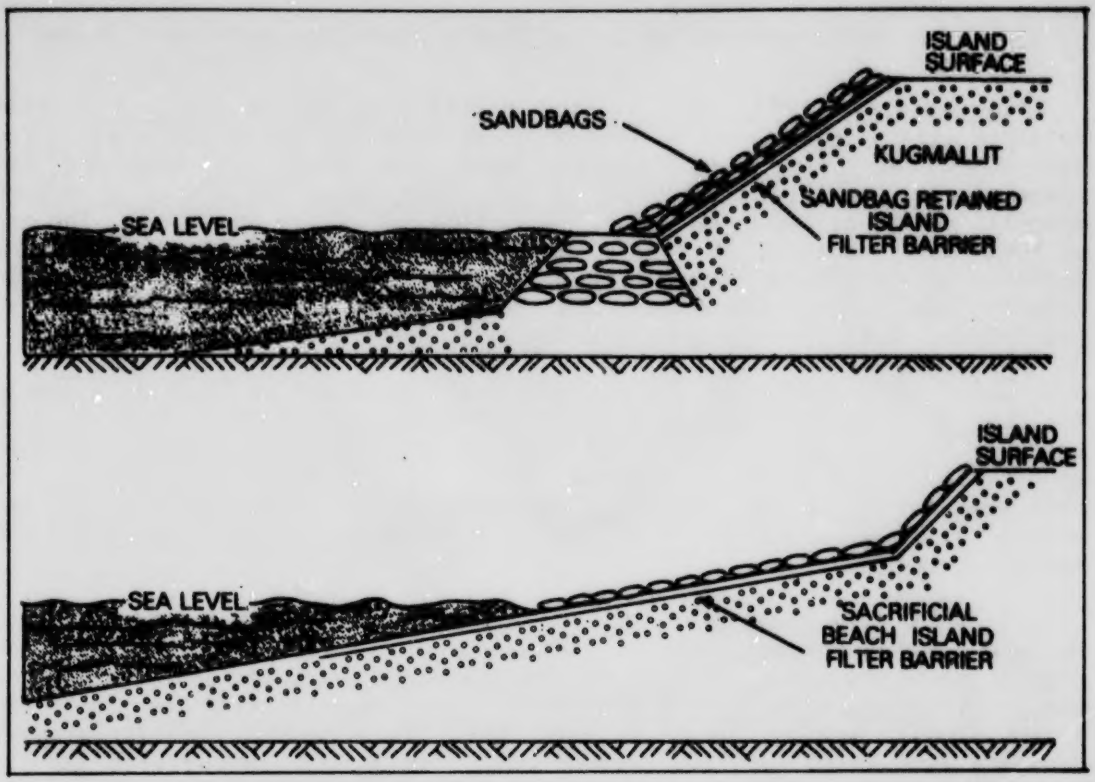

ISLAND SURFACE
SANDBAGS
KUGMALLIT
SANDBAG RETAINED ISLAND FILTER BARRIER
SEA LEVEL
ISLAND SURFACE
SEA LEVEL
SACRIFICIAL BEACH ISLAND FILTER BARRIER

Figure 9. Sandbag-retained island and sacrificial beach island construction.
(Source: Esso, Home Oil Mackenzie Delta-Beaufort Sea 1983 Offshore Construction.)

Marine Drilling Ltd. (Canmar) for Gulf, and was ready for drilling in 1982. During 1981, Dome began to construct a Single Steel Drilling Caisson (SSDC), modifying the forward half of a 250,000 DWT tanker and placing it on the Uviluk berm in 1982.

In 1982, six islands were at various stages of construction. Esso completed Itiyok, a sacrificial beach island located in 15 metres of water. Two caisson-retained islands were started at Minuk and Kadluk, but only the latter was completed during 1982. Gulf made some modifications to and finished remedial work on Tarsiut, and completed the berm at Kogyuk N-67. Dome completed dredging and levelling the Uviluk berm in August after which the SSDC was ballasted down onto the berm site in October. Finally, two hopper dredges began work on Dome's island, Nerlerk, where 3,000,000 m^3 of material was dredged.

In September 1983, Esso started drilling at Kadluk O-07, a caisson-retained island constructed in 1982-83. The company plans to drill wells from two other caisson-retained islands, Amerk and Minuk, in 1984 and 1985 respectively. Work on Amerk began in July 1983, where 967,000 m^3 of dredged material was deposited by November, completing 36% of the operation. The berm at Minuk was completed in 1983. In July, Esso also began construction at Nipterk, a sacrificial beach island. A total of 439,000 m^3 of dredged material was placed there in 1983, bringing the project to 26% of its completion. Drilling is expected to begin at Nipterk in October 1984.

Gulf's 1983 operations included the drilling of two wells using a special floating drilling ship called a Conical Drilling Unit (CDU). When a CDU is used, no dredging is required other than for glory hole excavation. Drilling at Pitsiuluk began early in September 1983. At East Amauligak, where a glory hole was started in 1982, drilling commenced in the second week of October. Another glory hole, Kugdjuk A-92, was also completed by Gulf during the 1983 operating season.

In 1983, Dome engaged in rebuilding the subsea berm at the Nerlerk site. Nerlerk B-67 experienced density problems with the berm materials (sand and clay/silt) in the summer of 1983 and the operation was suspended. At a second Nerlerk site, one mile distant from B-67, various construction techniques were investigated. However, as of December 1983, there were no definite plans to complete operations at this second site. Original plans called for the completion of a Nerlerk berm by October 1983, so that Dome could set down a SSDC during November of the same year. Since Nerlerk was not completed, Gulf employed the SSDC at their Kogyuk site, where drilling began late in October, 1983.

Nerlerk is the last berm/island that Dome plans to construct until the 1984 season. The company's long range projections however include the construction of at least one new island per year. It is anticipated that one of these exploration islands, at minimum, will eventually be upgraded to a production facility.

Table 4 summarizes artificial island dredging activities as they occurred over the period 1972 to 1982. Figures 10 to 13 illustrate annual and seasonal dredging volumes, volumes dredged by company/operator, and by dredge vessel over the same period.

Table 5 shows plans by Dome, Esso and Gulf for artificial island construction and drilling in the future.

Table 4. Total volume dredged (m^3) by month and year for artificial islands 1972 to 1982.

MONTH OF OPERATION	JAN	FEB	MAR	JUNE	JULY	AUG	SEPT	OCT	MONTH UNKNOWN	TOTAL
Name and Year(s)										
Immerk B-48 1972,73					182,700	267,200	133,900		583,800	
Adgo F-28 1973						5,860	37,140			43,000
Netserk N-40 1974,75					258,842	66,918	8,740			334,500
Netserk B-44 1974					78,160	151,450	102,590			332,200
Adgo P-25 1974						6,820	23,880			30,700
Pullen E-17 1974		32,100	35,500							67,600
Pelly B-35 1974									8,054	8,054
Unark L-24 1974									45,078	45,078
Adgo C-15 1975		40,040	33,360							73,400
Ikattok J-17 1975					37,600					37,600
Kugmallit H-59 1976					83,040	183,870	35,590			302,500
Adgo J-27 1976						17,720	39,380			57,100
Isserk H-47 1976							120,034		38,610	158,644
Arnak L-30 1976					279,860	1,115,140				1,295,000

Table 4. Total volume dredged (m^3) by month and year for artificial islands 1972 to 1982. continued

MONTH OF OPERATION	JAN	FEB	MAR	JUNE	JULY	AUG	SEPT	OCT	MONTH UNKNOWN	TOTAL
Name and Year(s)										
Kannerk G-42 1976							1,200,000			1,200,000
Sarpik B-35 1976	15,930	66,020	34,150							116,100
Isserk E-27 1977					499,773	922,952	893,182	369,093		2,685,000
Issungnak O-61 1979,80					939,880	1,634,580	2,247,530	899,010		5,721,000
Kaglulik M-64 1980							218,265	65,930		284,195
Tarsiut N-44 1980,81,82				30,988	615,853	607,570	309,641	576,682		2,140,734
Alerk P-23 1981					385,000	1,085,000	210,000			1,680,000
Hiyak I-27 1981,82					454,705	1,880,487	1,301,433	604,900		4,241,525
West Atkinson L-17 1981							955,900			955,900
Uviluk P-66 1981,82				209,379	857,217	274,231	200,845	233,869		1,775,541
Nerlerk B-67 1982						465,813	1,493,337	1,306,792		3,265,942
Nerkerk F-67 1982					13,863					13,863
Nerlerk J-77 1982					157,557	99,643				257,200
Kogyuk N-57 1982					99,320	236,840	229,200	45,840		611,200

Table 4. Total volume dredged (m^3) by month and year for artificial islands 1972 to 1982. continued

MONTH OF OPERATION	JAN*	FEB*	MAR*	JUNE	JULY	AUG	SEPT	OCT	MONTH UNKNOWN	TOTAL
Name and Year(s)										
Kadluk O-17 1982						252,300	257,600			509,900
Minuk I-53 1982							29,700	171,665		201,365
MONTHLY TOTALS	15,930	138,160	103,010	240,367	4,843,370	9,274,394	10,047,887	4,273,781	91,742	29,028,641

* Dredging on land

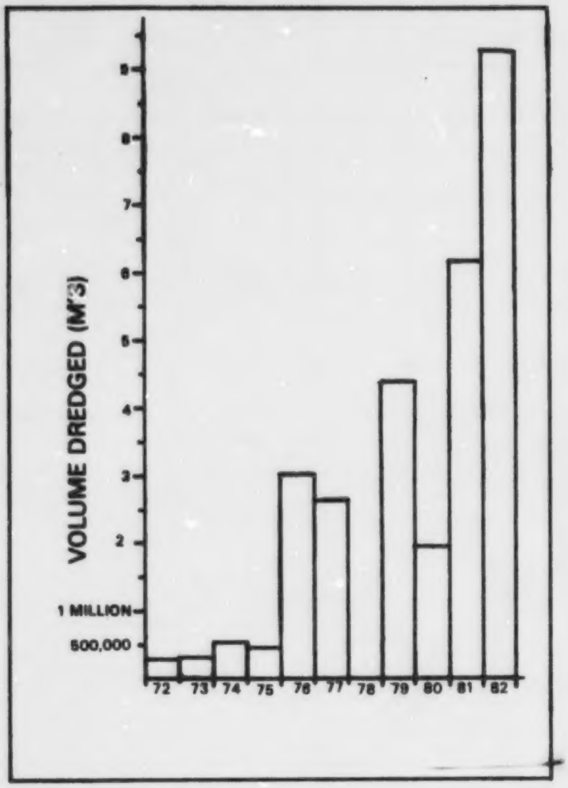


Figure 10. Total volumes dredged for artificial islands per year, 1972 to 1982.

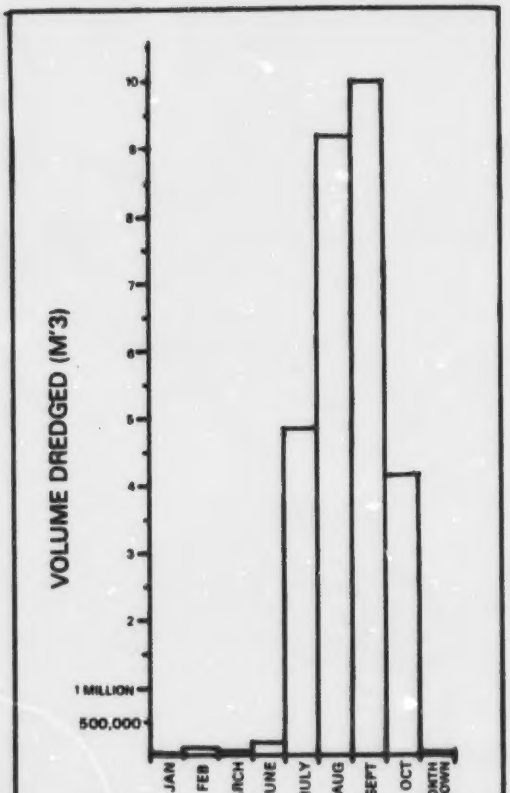


Figure 11. Total volumes dredged for artificial islands per month, 1972 to 1982.

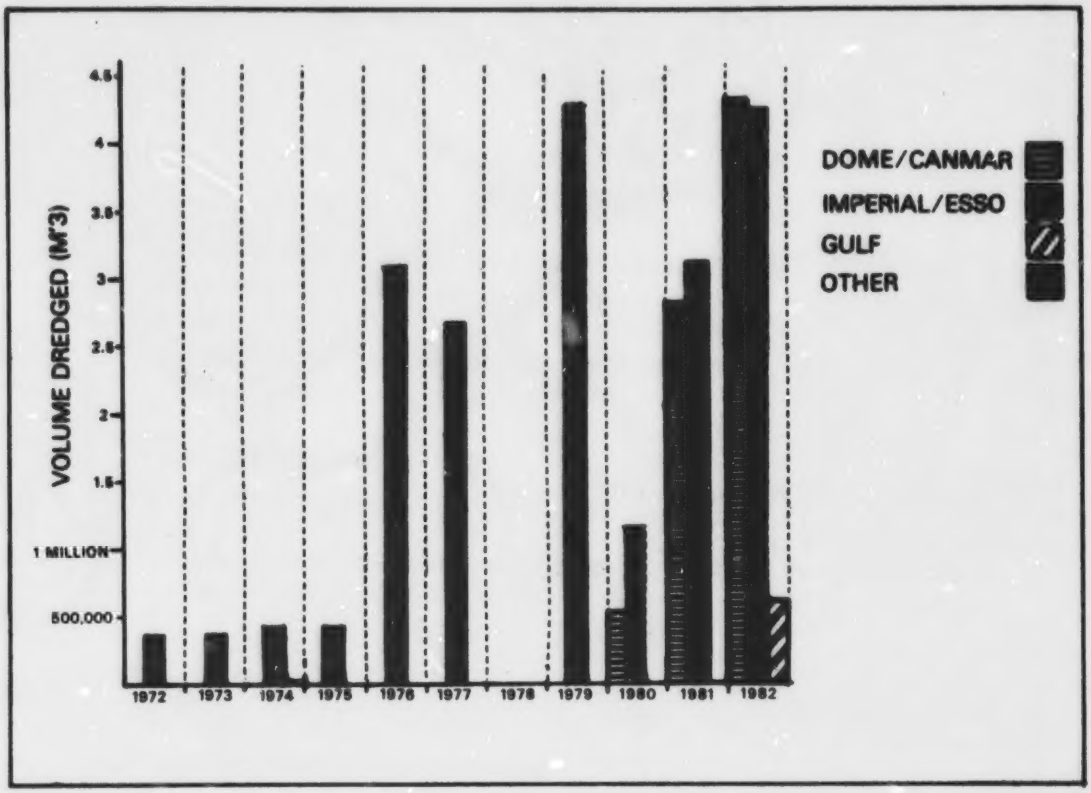


Figure 12. Volumes dredged by company/operator for artificial islands per year, 1972 to 1982.

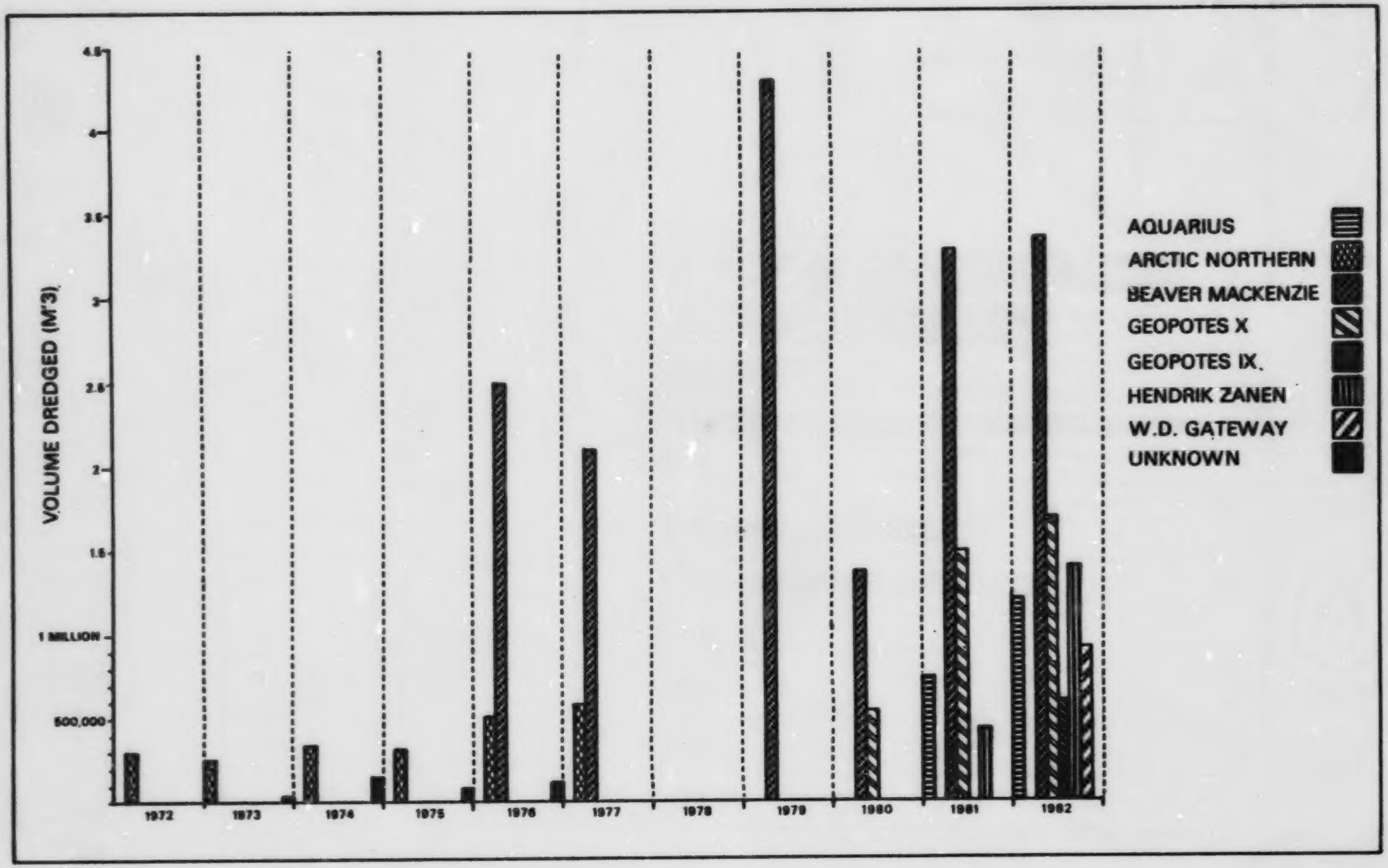


Figure 13. Volumes dredged by dredge vessel for artificial islands, 1972 to 1982.

Table 5. Future plans for artificial islands and drilling units.

Company	Construction year(s)	Location	Expected drilling date	Type of island/unit
Dome	1982-?	Nerlerk	?	SSDC
Dome	1984	?	Winter 1984	SSDC
Gulf	1983	Amauligak	August 1984	Conical Drilling Unit
Gulf	1983	Pitsiulak	July 1984	Conical Drilling Unit
Esso	1982-83	Kadluk	Winter 1983-84	Caisson-Retained Island
Esso	1983-84	Amerk	Winter 1984-85	Caisson-Retained Island
Esso	1982-85	Minuk	Winter 1985-86	Caisson-Retained Island
Esso	1983-85	Nipterk	Winter 1985-86	Sacrificial Beach Island
Esso	1983-84	Adgo	Winter 1984-85	Sacrificial Beach Island

(Sources: Bob Morrison, Gulf, 1983
John Ward, Dome, 1983
Home Oil, Esso, 1983
COGLA Weekly Report of Exploration, Aug. 10, 1983, Aug. 17, 1983, Jan. 18, 1984.)

3.1.3 Wellhead burial (Glory holes)

For exploration wells drilled by drillship, Dome and Gulf dredge a cone-shaped hole called a "glory hole" in the sea floor. The drillship is connected to the wellhead by a flexible marine riser. A minimum water depth is required to allow for ± 5° tolerance (movement) of the riser's ball joint. In shallow waters (less than approximately 20 metres) a glory hole is required to artificially deepen the water in the vicinity of the wellhead.

Glory holes are also required when seabed installations may be threatened by the grounding and scraping of ice. In such cases, the wellhead equipment is placed in the hole so that the top of the blow-out preventer (BOP) is below the level of potential ice scour. Should ice approach too close to a drillship, the companies can use their quick release capability to disengage the drillship from the wellhead and move away from the threatened area, without having to abandon their uncompleted well.

The companies have different methods of dredging glory holes. Dome's operator uses a large drillbit nearly two metres in diameter. Three holes are drilled in a cloverleaf pattern resulting in the estimated displacement of a relatively-small quantity of material (between 10,000 and 20,000 m^3). Gulf has used dredges (usually trailing suction hoppers, sometimes cutter suctions) and a drillship to excavate glory holes. The dredges usually excavate significantly more material than the drillships; for example, the Geopotes IX displaced 39,100 m^3 of material for the glory hole at East Amauligak (Bill Livingstone, Gulf, pers. comm., 1984). When dredges are used to excavate the glory hole, they repeatedly dredge overtop the specified area until the resulting hole is of required depth. In contrast, when drillships are employed the drill is able to excavate a near vertical hole, and therefore material removed is simply displaced around the top of the hole. In August 1983, Gulf operators employed a new hydraulic grab system in conjunction with dredge vessels for dredging glory holes. This system reduces the amount of material displaced to an estimated 30,000 m^3 (Bill Livingstone, Gulf, pers. comm. 1984).

3.1.4 Other potential dredging requirements

3.1.4.1 Landfills

One important use of seabottom materials excavated by marine dredging operations is terrestrial landfill. For example, Tuktoyaktuk townsite is situated on a peninsular gravel bar bordered by small lakes and poorly drained tundra. The town experiences a shortage of land suitable for ongoing community and industrial development, and a shortage of nearby terrestrial sources of landfill. In the past, dredging from Tuktoyaktuk Harbour provided sand and gravel for a housing subdivision (September and October, 1979), and sand and silt for the construction of a potable water reservoir (June to September 1981). A number of dock construction operations at company bases have also used dredged material for fill. For the planned Tuktoyaktuk airport expansion, dredging from the harbour is considered as the best, most economical source of required material.

As expansion continues at existing support bases and at communities in the Beaufort region, marine dredging operations aimed at fulfilling landfill requirements will undoubtedly increase in number and scale.

3.1.4.2 Subsea pipelines

Industry proposes to use small-diameter, subsea pipelines for oil gathering, water injection and gas re-injection if commercial reserves are discovered offshore. The environmental constraints of the region's oceanography and surficial geology will require that gathering and trunk pipelines be buried below the seabed as protection against ice scouring.

To achieve the required trenching depth, a dredge such as an existing cutter suction could be used in less than 20 metres of water, while a trailing suction hopper dredge would be essential for greater depths. Industry calculates that the pipeline burial trenches should be dredged to a maximum depth of 5 metres below the sea floor, and a maximum width of approximately 20 metres (Beaufort Sea/Mackenzie Delta Environmental Impact Statement, Volume 2, 1982). After pipeline installation, additional lowering could be achieved using smaller specialized equipment such as a post-trenching plow, jetting, or mechanical cutter. There are also special "subsea tractors" designed for trenching pipelines. One industry scenario of subsea gathering pipelines in support of an overland pipeline assumes the dredging of approximately 6.5 million m^3 of material (Figure 14).

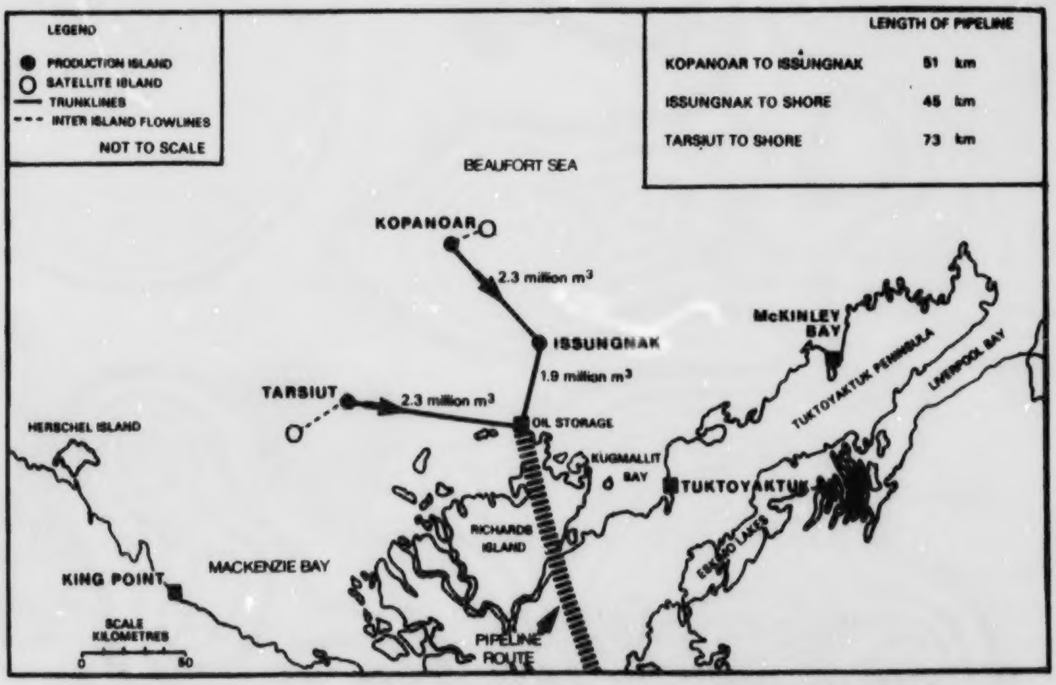


Figure 14. Proposed pipelines and associated volume of dredged material. (Adapted from: Beaufort Sea/Mackenzie Valley Environmental Impact Statement, 1982, Volume 2, Fig. 4.6-4.)

3.2 Types of dredges

Several types and sizes of dredges have been used in the Beaufort Sea, primarily in support of offshore island construction and for harbour and channel excavation and maintenance. Hydraulic dredges are used most extensively for large scale capital and maintenance projects, while mechanical dredges usually operate in restricted or shallow water locations, and for dredging hard or very cohesive materials.

3.2.1 Hydraulic dredges

Hydraulic dredges fall into two major categories, based on mobility; cutter suction and stationary suction dredges, and trailing suction hopper dredges.

3.2.1.1 Cutter suction

Cutter suction dredges are equipped at the bow with a ladder that accommodates a cutter drive, sometimes a submerged pump (or pumps), and a suction inlet. The ladder terminates with a rotating excavating tool called the cutterhead. As a unit, the entire structure can be raised or lowered to a desired dredging depth. The cutterhead is situated directly forward of the suction inlet. It dislodges seafloor material which, mixed with water, is drawn up through the suction pipe. This slurry is then pumped by pipeline either directly to the disposal site or into adjacent barges. The cutterhead allows the vessel to dredge a wide variety of materials, from sand, silt and clay to gravel and unconsolidated sedimentary bedrock.

Cutter suction dredges are also equipped with two stern-mounted spuds, one of which is lowered to act as a pivot. With the aid of anchors, cables and winches, the vessel swings about the pivot, and moves back and forth in an arc across its area of operation. Cutter suction dredges are used where the cutter head must be positioned accurately, or where sediments are deep and water depths vary. Cutter suction dredges are not suited to high traffic areas. Dredged material is passed through the vessel's pipeline over relatively short distances (about 1 km) to a disposal site.

Industry has operated two cutter suction dredges in the Beaufort region. The Aquarius (Figure 15), owned by Zanen Verstoep Ltd. of Holland, has operated since 1979 under contract to Canmar. Another, the Arctic Northern, is owned by Northern Construction of Vancouver and has been contracted to Esso (Table 6).

3.2.1.2 Stationary suction

In situations where load and dump sites are in close proximity, stationary suction dredges can be employed using floating or submerged pipelines. Although a stationary suction dredge works on the same principle as a cutter suction dredge, the stationary dredge lacks an excavating tool to loosen the material, and its means of moving on site is by winches. Sand and silt are pumped, or "suctioned" from the seafloor and discharged to a pipeline for immediate disposal or into barges for transportation to more distant dump sites.

Esso has contracted two stationary suction dredges for operating in the Beaufort Sea. The Sceptre Mackenzie, owned by Sceptre-Riedel-Dawson Constructors Ltd. of Vancouver, was a hydraulic suction system temporarily assembled on a barge; it was used only during a 1979-80 island construction operation (Table 7). The Beaver Mackenzie has been active in the Beaufort Sea since 1975, and was modified to a cutter suction in 1983 (Figure 16). The vessel is owned by Westminister Dredging Company, Ltd., London, England, and is operated through Beaver Dredging Company Ltd. of Calgary.

3.2.1.3 Trailing suction hopper

Industry employs trailing suction hopper dredges for marine operations where borrow material is located at greater distances from the dump site. These self-propelled dredges have a large "hopper" or containment area on board, into which dredged seafloor material is pumped through a draghead. Once the hopper is filled, the vessel transports the material to the discharge site. Unloading occurs either by dumping material through bottom valves or drag arm, or by discharging the dredge spoils through pipes over the bow. These vessels can easily excavate silt, sand and gravel, but pretreatment (loosening) is usually necessary before dredging rocky or cemented material.

Five trailing suction hopper dredges have operated in the Beaufort area over the past three years. Dome/Canmar and Gulf/Beudrill have contracts with Volker Stevin Dredging Company Ltd. of Holland for the use of the Geopotes X and Geopotes IX respectively. The Geopotes X (Figure 17) arrived in the Beaufort area late in the 1980 operating season. The Geopotes IX (Figure 18) was leased in September 1981 but started operations in 1982. The Hendrik Zanen (Table 8) owned by Zanen Verstoep Ltd., was first active during 1981 on lease to Canmar. In 1982, Esso contracted the use of a trailing suction hopper dredge, the Gateway (Figure 19), owned by Beaver Dredging Ltd. Esso began operating a second trailing suction hopper dredge owned by Zanen Verstoep Ltd., the Cornelis Zanen (Figure 20), during August 1983. The Gateway, the Cornelis Zanen and the Geopotes X have the ability to discharge dredge spoils over their bows.

3.2.2 Mechanical dredges

Mechanical dredges are also used in dredging operations in the Beaufort Sea, primarily as support or secondary machinery for small-scale tasks. Clamshell or grapple dredges (Figure 21), directly analogous to land based cranes, have been used in operations in Tuktoyaktuk Harbour for channel maintenance, and at Tuft Point for breakwater operations. When mounted on barges, these cranes have aided in the construction and abandonment (cleanup) of artificial islands.

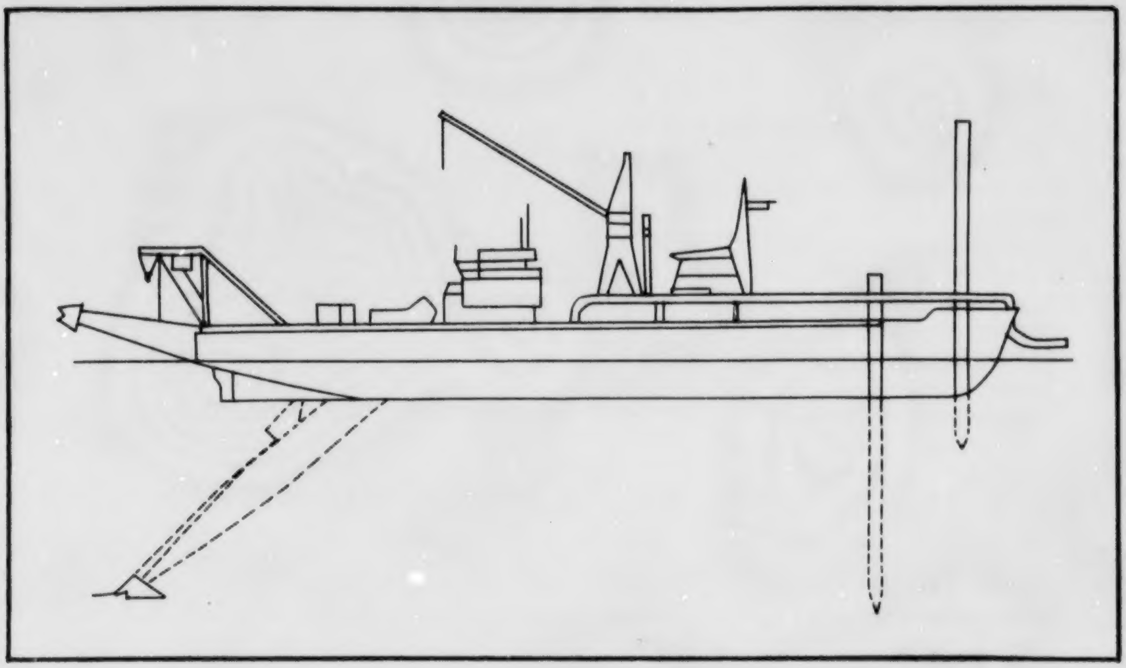
The Manitowac, for example, was used by Esso as early as 1973 to construct the Adgo F-28 island. In addition, floating dipper dredges, comparable to mechanical excavating shovels (Figure 21), are sometimes used for small-scale cleanup or fill operations.

Table 9 lists volumes dredged since 1972 by type of dredge vessel.

3.2.3 Future dredges

Future development of potential offshore hydrocarbons will require substantial dredging to meet the construction needs of artificial islands and seafloor trenches necessary for subsea pipelines. Industry has projected that, by the year 1995, dredging rates may reach between 60 and 70 million m^3 of material annually (Beaufort Sea/Mackenzie Delta Environmental Impact Statement, Volume 2, 1982) as compared to a 1982 rate of 9.6 million m^3.

To accommodate their large-scale and year-round operations, Dome has designed a large capacity, hydraulic, ice-breaking hopper dredge. This so-called "Super Dredge" is to be a Class 6 icebreaker for year-round unassisted movement through ice, with a draghead and suction pipe protected from ice by moon pool enclosures. Retractable dredge pipes will extend to a water depth of 80 metres, more than twice the dredging depth of conventional hopper dredges. The hopper capacity will be 25,000 m^3, two to three times greater than that of existing hopper dredges. Some components of the "Super Dredge" have been manufactured, (Figure 22) but plans for their assembly have since been deferred (John Duff, Dome. Pers. comm., 1984).



Length	107 m
Width	19.0 m
Loaded Draft (operating)	4.4 m
Deadweight	1725 metric tons
Maximum Cutter Depth	25.0 m (modified to 70 m 1982)
Cutter Diameter	2.9 m
Pump Drive	3800 H.P. x 2
Pipeline Diameter	90 cm
Pipeline (max.) Length	approx. 2 km land length, 1 km floating length
Number Engines	4
Installed Horsepower	17500
Spuds	2 (each 100 metric tons 37 m long)
Registered Ship Owner	Zanen Verstoep (Holland)

Figure 15. Cutter suction dredge Aquarius specifications.

Table 6. Cutter suction dredge *Arctic Northern* specifications.

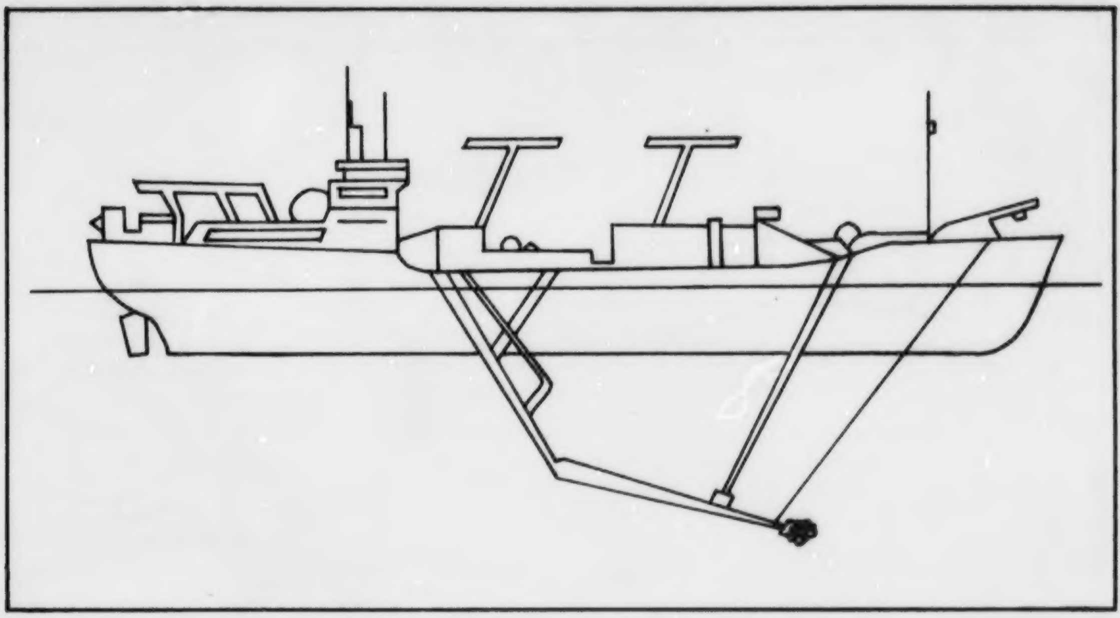
Length	35.4 m
Width	110 m
Loaded Draft (operating)	1.2 m
Deadweight	385.6 metric tons
Maximum Cutter Depth	18.3 m
Cutter Diameter	23 m
Pump Drive	2250 x 2
Pipeline Diameter	61 cm
Pipeline (max.) Length	1 km floating length
Number Engines	4
Installed Horsepower	3275
Spuds	2 (each 61 cm diam., 21.3 m)
Registered Ship Owner	Northern Construction (Vancouver, B.C.)

Table 7. Stationary suction dredge *Sceptre Mackenzie* specifications.

Length (barge)	76.2 m
Width (barge)	15.2 m
Draft (barge)	3.2 m
Deadweight	650 metric tons
Suction Pipe Diameter	61 cm
Pipeline (max.) Length	500.0 m
Maximum Suction Depth	57.0 m
Installed Horsepower	3200
Registered Ship Owner	Sceptre-Riedel-Dawson Constructors Ltd. (Vancouver, B.C.)

Table 8. Trailing suction hopper dredge *Hendrik Zanen* specifications.

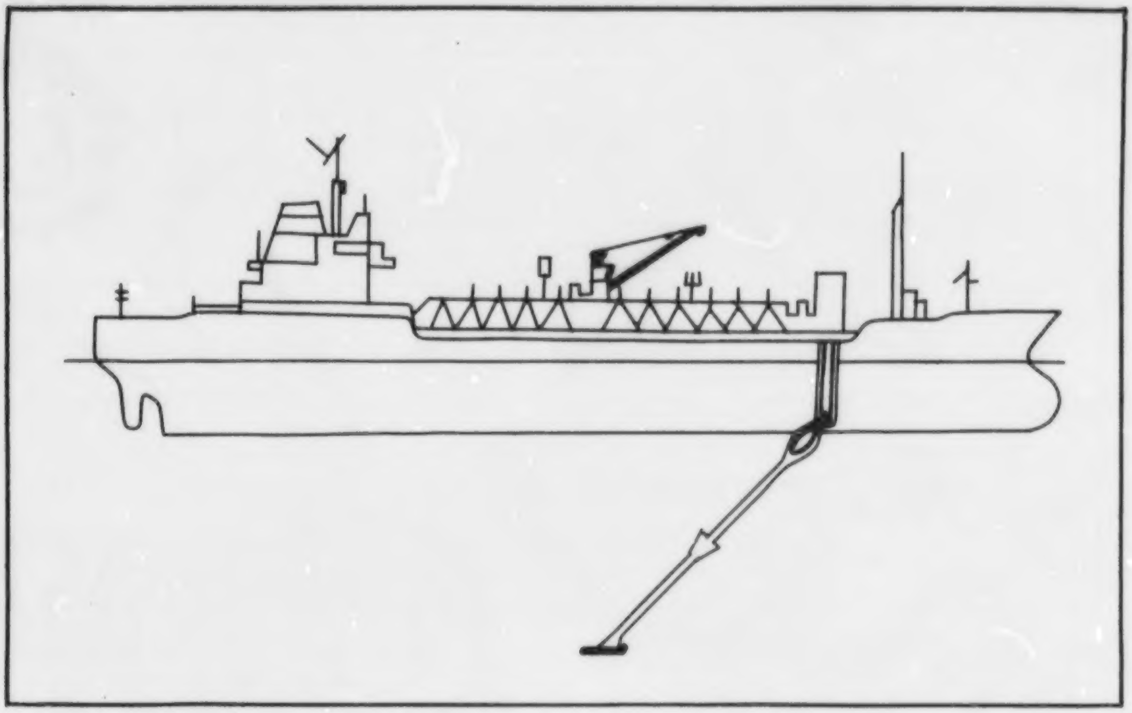
Length	121.0 m
Width	18.5 m
Loaded Draft	9.5 m
Deadweight	unavailable
Hopper Capacity	5760 m^3
Dredge Depth	36.0 m
Number of Suction Pipes	2
Suction Pipe Diameter	90 cm
Sailing Speed	13 knots unloaded; 12 knots loaded
Registered Ship Owner	Zanen Verstoep (The Hague, Holland)



Length	80.0 m
Width	13.0 m
Loaded Draft	4.0 m
Deadweight	1500 metric tons (approximate)
Suction Pipe Diameter	85 cm
Pipeline (max.) Length	500 m
Maximum Suction Depth	49 m (45 m with extended pipe)
Installed Horsepower	975
Registered Ship Owner	Beaver Dredging Ltd. (Calgary, Alta.)

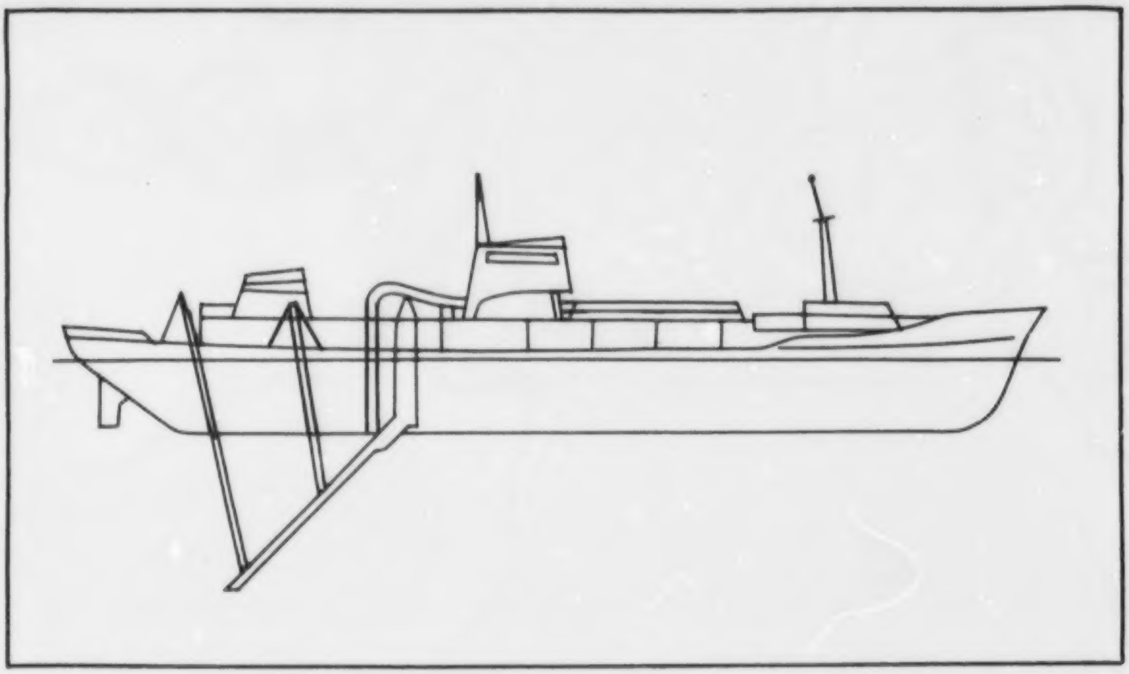
*Modified to Cutter suction in 1983

Figure 16. Stationary suction dredge *Beaver Mackenzie* specifications.



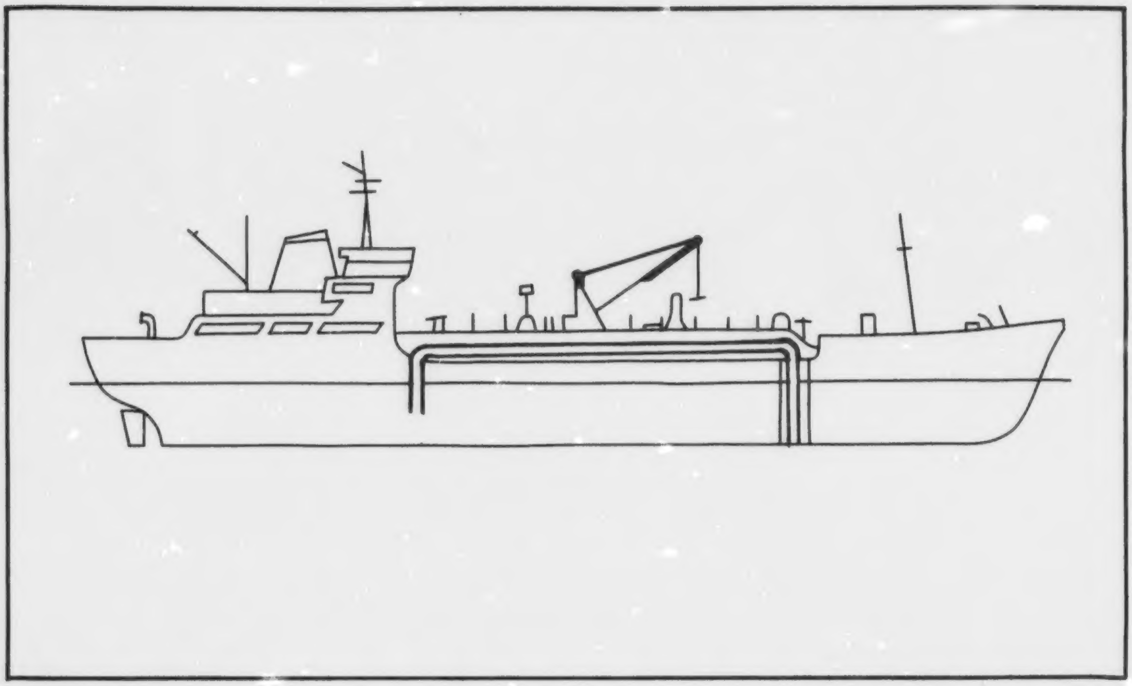
Length	135.0 m
Width	21.6 m
Loaded Draft	12.5 m
Deadweight	17170 metric tons
Hopper Capacity	9000 m^3
Dredge Depth	34 m
Number of Suction Pipes	2
Suction Pipe Diameter	1.2 m
Sailing Speed	16 knots unloaded
Registered Ship Owner	Volker Stevin Dredging (Holland)

Figure 17. Trailing suction hopper dredge Geopotes X specifications.



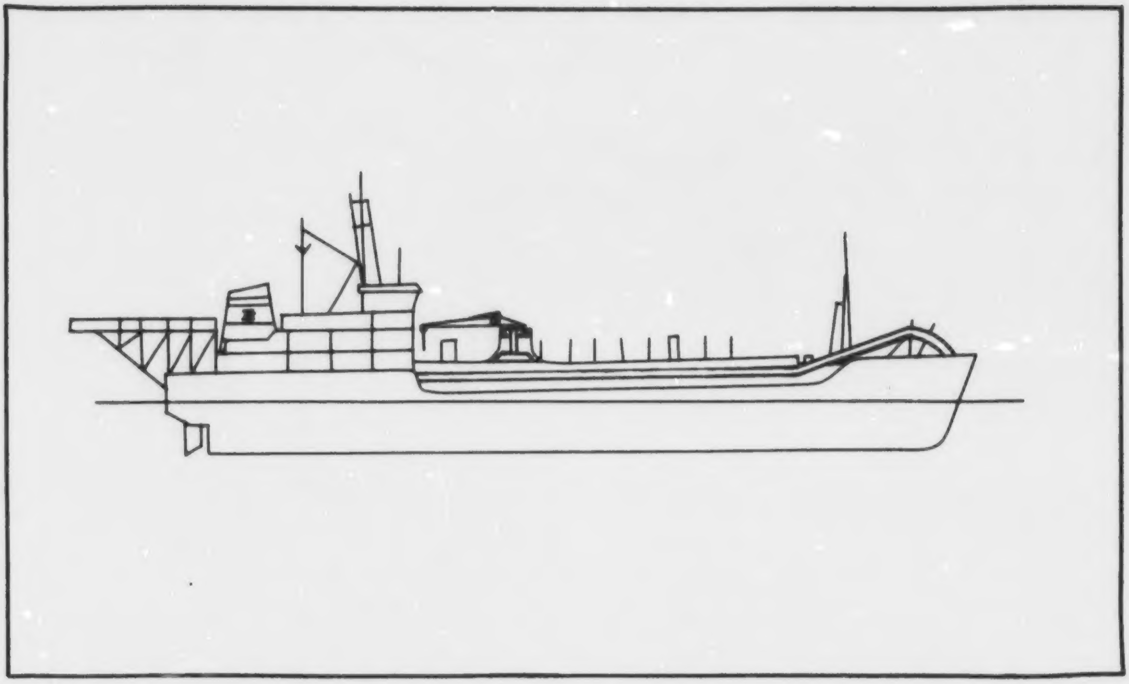
Length	128.5 m
Width	21.1 m
Loaded Draft	8.1 m
Deadweight	10558 metric tons
Hopper Capacity	6400.0 m^3
Dredge Depth	35 m
Number of Suction Pipes	2
Suction Pipe Diameter	90 cm
Sailing Speed	12 knots unloaded
Registered Ship Owner	Volker Stevin Dredging (Holland)

Figure 18. Trailing suction hopper dredge Geopotes IX specifications.



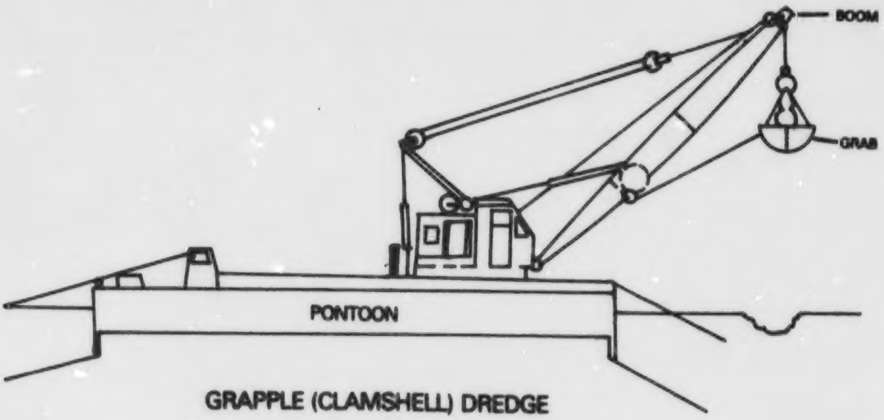
Length	127.2 m
Width	19.5 m
Loaded Draft	11.2 m
Deadweight	6225 metric tons (approximate)
Hopper Capacity	6145 m^3
Dredge Depth	30.0 m
Number of Suction Pipes	2
Sailing Speed	16 knots loaded
Registered Ship Owner	Beaver Dredging Ltd. (Calgary)

Figure 19. Trailing suction hopper dredge W.D. Gateway specifications.

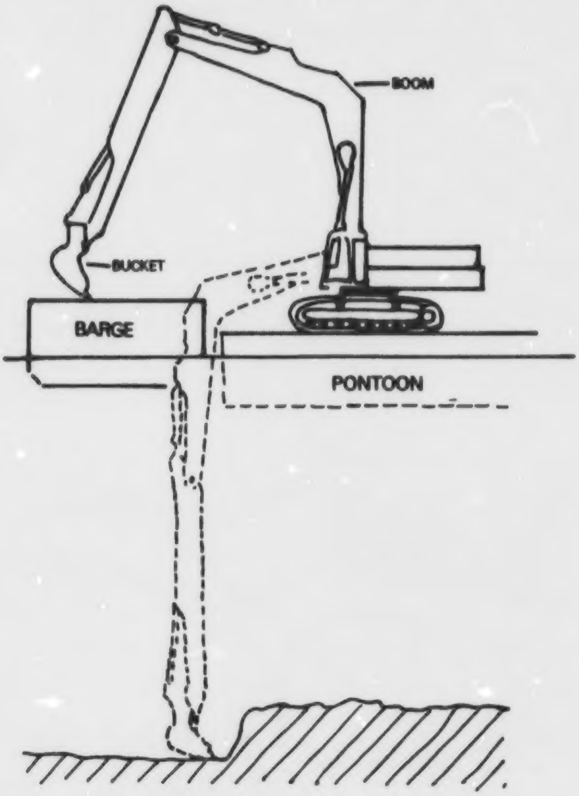


Length	128.0 m
Width	23.0 m
Loaded Draft	9.0 m
Deadweight	unavailable
Hopper Capacity	8000m^3
Dredge Depth	32.0 m (can be modified to 50.0 m)
Number of Suction Pipes	2
Sailing Speed	15.5 knots
Registered Ship Owner	Zanen Verstoep (Holland)

Figure 20. Trailing suction hopper dredge Cornelis Zanen specifications.



GRAPPLE (CLAMSHELL) DREDGE



DIPPER DREDGE

Figure 21. Mechanical dredges.
(Source: MacLaren Plansearch Report for Public Works Canada and Transport Canada, 1982.)

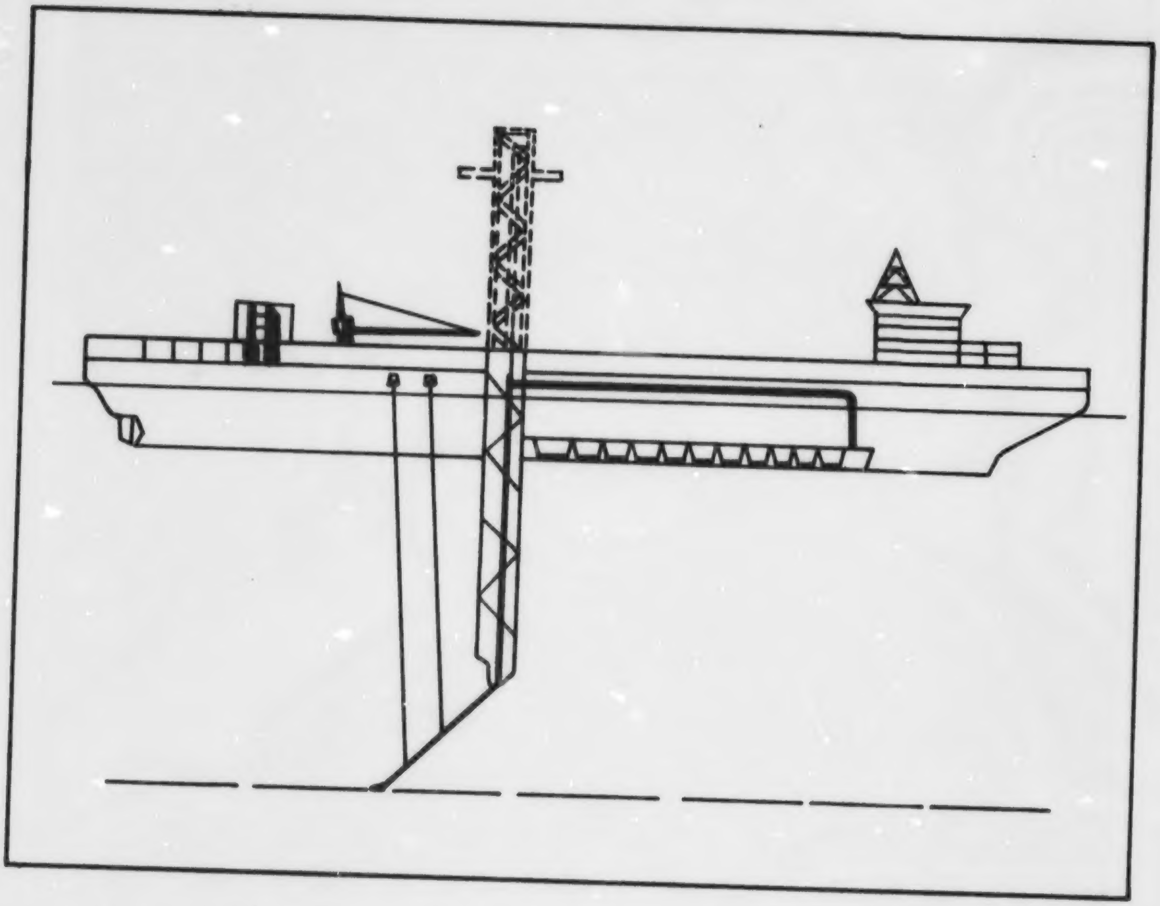


Figure 22. Dome's proposed Super dredge.

Table 9. Volumes dredged per dredge vessel type, 1972 to 1982.

Type of Dredge	Volume Dredged (M^3)
Barge	7,646
Clamshell and barge	8,054
Cutter suction	20,607,211
Stationary suction	18,238,382
Trailing suction hopper	7,130,453

PHOTO 1. Aquarius (Cutter suction dredge).

PHOTO 2. Beaver Mackenzie (Stationary suction dredge).

PHOTO 3. Hendrik Zanen (Trailing suction hopper dredge).

PHOTO 4. Geopotes IX (Trailing suction hopper dredge).

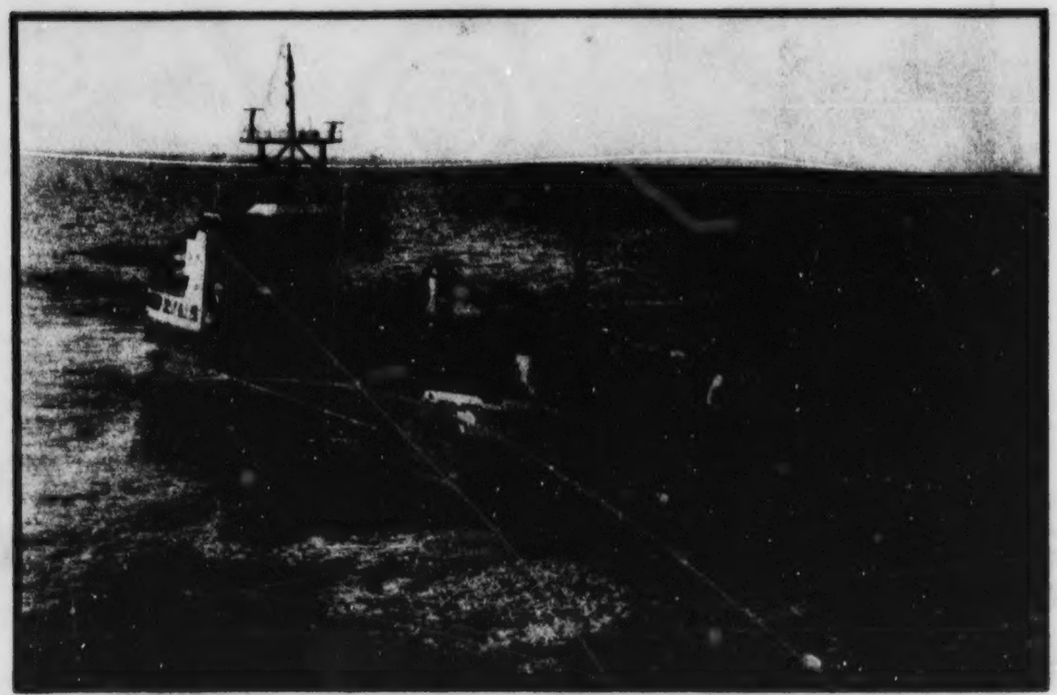


PHOTO 5. W.D. Gateway (Trailing suction hopper dredge).

PHOTO 6. Super dredge propeller.

4. OPERATIONS DATABASE

The following detailed database was produced on System 2000, a computer management system widely used in government agencies to order data and facts and to produce summaries. The Environmental Protection Service in Ottawa, for example, has produced an Ocean Dumping Control Act database on System 2000. This system was also employed to plot and compile the maps and tables in this section. This database contains descriptions of dredging operations that have occurred in the Beaufort Sea since 1959, the period 1972 to 1982 being most extensively documented.

4.1 Definitions and explanations

(a) Operation and identification number

An individual dredging operation is defined as all the loading and dumping activities of one particular dredge vessel leased by the same company at the same location(s) within the single calendar year; the operation may, however, occur during one or more intervals (days, weeks) of continuous activity.

Each dredging operation is assigned a unique identification number, used consistently throughout this catalogue for crossreference purposes. The identification number (e.g. 76BMZ-01) is a descriptive notation comprised of the following abbreviated parameters:

- Year of operation (abbreviated) e.g. 76 represents 1976;
- Dredge vessel name, alphabetically, with abbreviations:
  AQU - Aquarius
  ARN - Arctic Northern
  BMZ - Beaver Mackenzie
  DPW - DPW 324
  GEX - Geopotes X
  GIX - Geopotes IX
  HZN - Hendrik Zanen
  SCM - Sceptre Mackenzie
  UNK - Vessel Unknown
  WDG - W.D. Gateway;
- Different dredging locales (sequential, 2 digit numbers):

If the same dredge is used by the same company during one particular year, but at several different locations, the operations are distinguished by a number 01, 02, 03, and so on.

(b) Year

Calendar year of all operations.

(c) Company and year

Name of the company which commissioned/sponsored the operation and the year of this sponsorship.

(d) Dredge name

Name of the dredge (vessel/barge) used (e.g. Aquarius, Geopotes X, etc.).

(e) Dredge type
Type of dredge technology used (e.g. cutter suction, trailing hopper, etc.).

(f) Purpose
General reason for dredging requirement, including the specific name of location or structure (e.g. Uviluk P-66 island construction, Tuft Point breakwater).

(g) Load name
Common place name of the borrow, extraction or load site (e.g. Tuk Harbour, Kugmallit Bay).

(h) Load Latitude (Lat), Load Longitude (Long)
Actual location of the borrow, extraction or load site, given in decimal notation (e.g. 69.420000, 132.950000); this was the necessary format for plotting dredge locations on the computer-drawn maps. To aid some readers, Appendix 7.1 lists all load (and dump) sites using the more familiar "degree, minute, and second" description.

(i) Load Minimum (Min) Depth, Load Maximum (Max) Depth
Actual water depth (below sea surface) of borrow, extraction or load site, given in metres. Load sites which are on land (e.g. Ya Ya Lakes area) are not and can not be assigned a value of depth.

(j) Load sediment
Type of material (sand, silt, gravel, etc.) loaded at borrow site.

(k) Dump name
Common place name of site where dredged material was unloaded. Often, the same name and location as (f).

(l) Dump Latitude (Lat), Dump Longitude (Long)
Actual location of the deposit or dumpt site, given in decimal notation (e.g. 69.420000, 132.950000); this was the necessary format for plotting dredge locations on the computer-drawn maps. Appendix 7.1 lists all dump (and load) sites using the more familiar "degree, minute, and second" description.

(m) Dump Minimum (Min), Dump Maximum (Max) Depth
Actual water depth (below sea surface) of dump site is given in metres. Dump sites on land (e.g. Tuk Hamlet) were not assigned a value of depth.

(n) Dump method
Specific method or technique by which dredge material was released at site (e.g. bottom valve, pipeline discharge, etc.).

(o) Dump sediment
Type of material (e.g. sand, gravel, etc.) deposited at operation site.

(p) Island name
Specific name of artificial island under construction or maintenance (e.g. Itiyok I-27).

(q) Island type
Type of island (e.g. sacrificial beach, caisson-retained, etc.) under construction or maintenance.

(r) Island status
Status of artificial island (active or abandoned) in November 1983. If an island operation was cancelled after initial dredging, "Island type" has been entered as NA.

(s) Start date, Stop date
The month/day/year of the startup and cessation of dredging activity which was more or less continuous over the period of days or weeks.

Sometimes, specific dates were not found in the records examined. In such cases, the following examples of notations are used:

01/01/1972 - the month and day are not known, but the year was recorded as 1972; one exception to this notation is 76UNK-01 which commenced on 01/01/1976;
01/01/1900 or 1901 - the month, day, and year are not known.

(t) Load volume, Dump volume
The estimated amount (in cubic metres) of material removed from the borrow/load site and deposited/dumped near the same or at another location and estimated for each start/stop period as (s).

(u) Authority reference, Amount licensed, Term start, Term complete
Authority reference refers to the legislated authority under which the operation occurred (see Appendix 7.2).

Amount licensed refers to information contained within the authorizing document; more specifically, the amount of material licensed to be displaced.

Term start refers to information contained within the authorizing document; more specifically, the earliest licensed date that operations are allowed to begin.

Term complete refers to information contained within the authorizing document; more specifically, the licensed date by which operations must cease.

In cases where the information could not be located, the entire group of entries (Authority Reference, Amount Licensed, Term Start, Term Complete) has been left out of the dataset rather than entering repetitive lines of "Info not found in search".

(v) Remarks within datasets

In certain cases, entries within datasets have been replaced by one of three comments:

Information not found in search - This information could not be located by the authors during the document investigations or searches. In some cases, this information may exist, but time constraints did not permit extensive searches into all possible information sources.

NA (Not Applicable) - This comment appears where entries of database are not relevant to that particular dataset (e.g. Island Name). "Island Type" and "Island Status" are irrelevant to datasets dealing with harbour maintenance, and therefore, NA appears in these entry lines.

Proprietary - Where industry had information that it did not want to make public, database entries are labelled "Proprietary". This usually applies to the latitude and longitude of gravel or sand borrow sites.

(w) Glory holes

Dredging operations for construction of glory holes are noted under "Load" only.

(x) Comments

Comments include any miscellaneous information of interest or clarification pertaining only to that specific dataset.

(y) References

Information sources which provided details of each operation are listed. These include: letters, files, reports, and other documents.

To assist the reader who plans to continue using the database listings in Section 4.9, several introductory indexes and summary tables are provided. Table 10 outlines the different dredging operations and are identified by the dataset numbers according to purpose. The volumes dredged by various companies and operators are summarized in Table 11 for the period 1972 to 1982. Figures 23 and 24 depict total dredged volumes, both seasonally and annually, during this same 10-year period.

Table 10. Index of Beaufort Sea dredging operations by purpose and area.

A. HARBOUR, CHANNEL AND MOORING BASIN CONSTRUCTION AND MAINTENANCE

McKinley Bay: 79AQU-01, 80AQU-01, 81AQU-04, 82HZN-06, 82HZN-07.

Tuft Point: 76ARN-04, 76BMZ-01, 77ARN-03, 77BMZ-01, 78BMZ-01, 79BMZ-02, 82BMZ-02.

Tuktoyaktuk: 59DPW-01, 60DPW-01, 61DPW-01, 61DPW-02, 61DPW-03, 77ARN-01, 77UNK-01, 77UNK-02, 79ARN-01, 80AQU-02, 81AQU-01, 81AQU-02, 81BMZ-01, 81UNK-01, 82BMZ-01, 82UNK-02.

B. ARTIFICIAL ISLANDS

Immerk B-48: 72ARN-02, 73ARN-01
Adgo F-28: 73UNK-01, 73UNK-02
Netserk North 40: 74ARN-01, 75ARN-01, 75ARN-02
Netserk B-44: 74ARN-02
Adgo P-25: 74UNK-01
Pullen E-17: 74UNK-02
Pelly B-35: 74UNK-03
Unark L-24: 74UNK-04
Ikattok J-17: 75UNK-01
Kugmallit H-59: 76ARN-01
Adgo J-27: 76ARN-02
Isserk H-47: 76ARN-03
Arnak L-30: 76BMZ-02
Kannerk G-42: 76BMZ-03
Sarpik B-35: 76UNK-01
Adgo C-15: 75UNK-02
Isserk E-27: 77ARN-02, 77BMZ-02
Issungnak O-61: 79BMZ-01, 80BMZ-01, 80SCM-01
Kaglulik M-64: 80GEX-01, 80GEX-02
Tarsiut N-44: 80GEX-03, 80GEX-04, 80GEX-05, 81AQU-03, 81GEX-02, 81GEX-03, 81GEX-04, 81GEX-04, 81HZN-02, 81HZN-03, 81HZN-04, 81HZN-05, 82HZN-08
Alerk P-23: 81BMZ-02
Itiyok I-27: 81BMZ-03, 82BMZ-03, 82WDG-01
W. Atkinson L-17: 81BMZ-04
Uviluk P-66: 81GEX-01, 81GEX-05, 81GEX-06, 81HZN-01, 82GEX-01, 82GEX-03, 82GEX-05, 82HZN-01, 82HZN-03, 82HZN-05
Nerlerk B-67: 82AQU-02, 82GEX-06, 82HZN-09, 82HZN-10
Nerlerk F-67: 82GEX-02, 82HZN-02
Nerlerk J-77: 82GEX-04, 82HZN-04
Kogyuk N-67: 82GIX-02, 82GIX-03
Kadluk O-17: 82WDG-02
Minuk I-53: 82WDG-03

Table 10. Index of Beaufort Sea dredging operations by purpose and area. continued

C. GLORY HOLES

Tingmiark K-91: 76UNK-02
Kaglulik A-75: 77UNK-03
Natserk E-56: 78UNK-01
Ukalerk 2C-50: 78UNK-02
Kaglulik M-64: 78UNK-03
Koakoak O-22: 79UNK-01
Killanak A-77: 80UNK-01
N. Issungnak L-86: 81EXI-01
Kiggavik A-43: 82AQU-01
E. Amauligak I-44: 82GIX-01
Natiak O-44: 82UNK-01

D. OTHER

72ARN-01, 81BMZ-05, 82GEX-07

Table 11. Total volumes dredged (m^3) by company/operator per year, 1972 to 1982.

1972	Imperial/Esso	304,000
1973	Imperial/Esso	322,800
1974	Imperial/Esso	454,460
	Sun Oil Ltd.	53,132
1975	Imperial/Esso	421,540
1976	Dome/Canmar	18,519
	Imperial/Esso	3,883,395
1977	Arcnav Marine Ltd.	7,646
	Dome/Canmar	37,038
	Imperial/Esso	3,715,000
1978	Dome/Canmar	55,557
	Imperial/Esso	450,000
1979	Dome/Canmar	3,445,519
	Government N.W.T.	80,000
	Imperial Esso	4,781,620
1980	Dome/Canmar	6,791,597
	Imperial/Esso	1,389,380
1981	Arctic Transportation Ltd.	5,100
	Dome/Canmar	7,140,998
	Gulf	10,000
	Imperial/Esso	3,438,474
1982	Arctic Transportation Ltd.	9,000
	Dome/Canmar	4,430,836
	Gulf	699,300
	Imperial/Esso	4,453,865

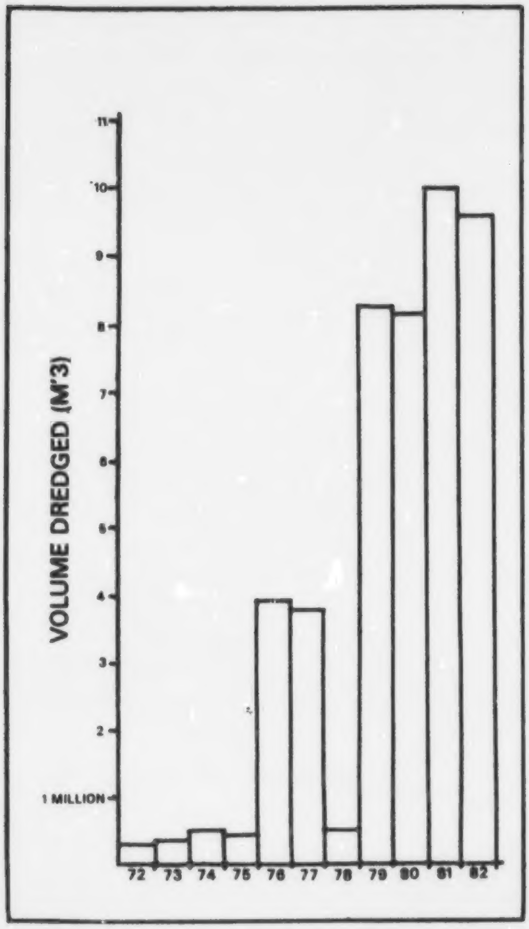


Figure 23. Total volumes dredged per year 1972 to 1982.

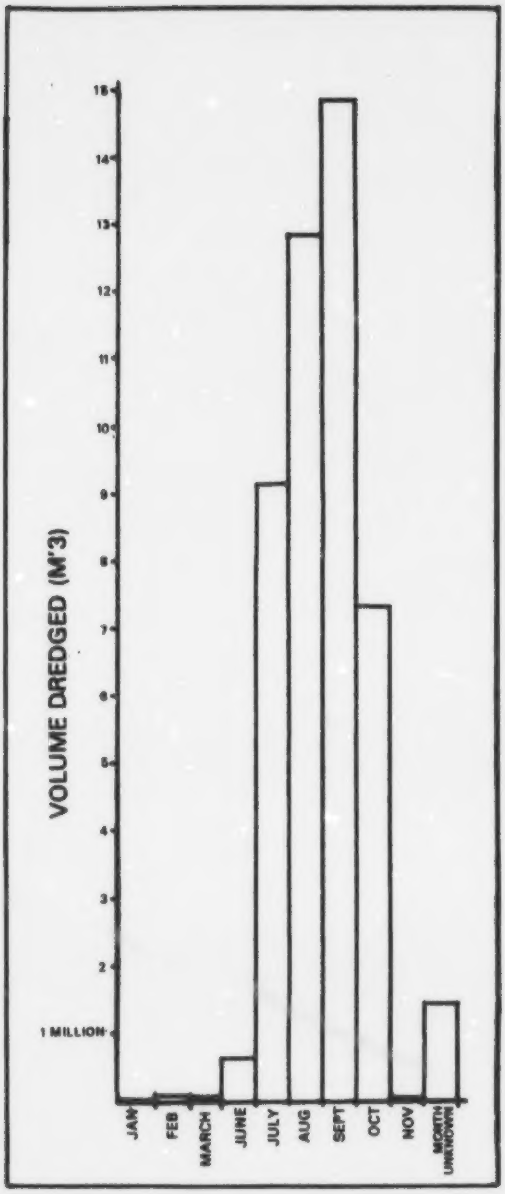


Figure 24. Total volumes dredged per month 1972 to 1982.

4.2 Database

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DATASET NUMBER* 59DPW-01
YEAR* 1959
COMPANY & YEAR* PUBLIC WORKS CANADA 1959
DREDGE NAME* DPW 324
DREDGE TYPE* CUTTER SUCTION
PURPOSE* TUK HARBOUR AND CHANNEL MAINTENANCE
LOAD NAME* TUK EAST CHANNEL
LOAD LAT*  69.450000
LOAD LON* 132.980000
LOAD MIN DEPTH*    .5
LOAD MAX DEPTH*   2.0
LOAD SEDIMENT* GRAVEL, SAND, SILT
DUMP NAME* TUK EAST CHANNEL
DUMP LAT*  69.450000
DUMP LON* 132.980000
DUMP MIN DEPTH*   INFORMATION NOT FOUND IN SEARCH
DUMP MAX DEPTH*   INFORMATION NOT FOUND IN SEARCH
DUMP METHOD* PIPELINE DISCHARGE
DUMP SEDIMENT* GRAVEL, SAND, SILT
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  07/22/1959
  STOP DATE*  07/31/1959
  LOAD VOL*        6974
  DUMP VOL*        6974

  START DATE*  08/01/1959
  STOP DATE*  08/31/1959
  LOAD VOL*       21619
  DUMP VOL*       21619

  START DATE*  09/01/1959
  STOP DATE*  09/09/1959
  LOAD VOL*       62766
  DUMP VOL*       62766

  COMMENT* LAT AND LON FOR DUMPSITE ARE APPROXIMATE.

  COMMENT* MONTHLY TOTALS ARE APPROXIMATE. THEY REPRESENT PORTIONS OF
       THE TOTAL VOLUME DREDGED (34870 M'3) IN THE GIVEN PERIOD.

  COMMENT* DREDGE DPW 324 WAS RENAMED DPW 224.

  REFERENCE* LETTER FROM C. COLP (DEPT. OF PUBLIC WORKS, EDMONTON) TO
       D. TAYLOR (DEPT. OF FISHERIES AND OCEANS, SIDNEY) 07/15/83.


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DATASET NUMBER* 60DPW-01
YEAR* 1960
COMPANY & YEAR* PUBLIC WORKS CANADA 1960
DREDGE NAME* DPW 324
DREDGE TYPE* CUTTER SUCTION
PURPOSE* TUK HARBOUR AND CHANNEL MAINTENANCE
LOAD NAME* TUK EAST CHANNEL
LOAD LAT*  69.450000
LOAD LON* 132.980000
LOAD MIN DEPTH*   2.0
LOAD MAX DEPTH*   2.0
LOAD SEDIMENT* GRAVEL, SAND, SILT, CLAY
DUMP NAME* TUK EAST CHANNEL
DUMP LAT*  69.450000
DUMP LON* 132.980000
DUMP MIN DEPTH*   INFORMATION NOT FOUND IN SEARCH
DUMP MAX DEPTH*   INFORMATION NOT FOUND IN SEARCH
DUMP METHOD* PIPELINE DISCHARGE
DUMP SEDIMENT* SAND, SILT, GRAVEL, CLAY
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  07/18/1960
  STOP DATE*  07/31/1960
  LOAD VOL*        8461
  DUMP VOL*        8461

  START DATE*  08/01/1960
  STOP DATE*  08/31/1960
  LOAD VOL*       18726
  DUMP VOL*       18726

  START DATE*  09/01/1960
  STOP DATE*  09/13/1960
  LOAD VOL*        7870
  DUMP VOL*        7870

  COMMENT* LAT AND LON FOR DUMPSITE ARE APPROXIMATE.

  COMMENT* MONTHLY TOTALS ARE APPROXIMATE. THEY REPRESENT PORTIONS OF
       THE TOTAL VOLUME DREDGED (35052 M'3) IN THE GIVEN PERIOD.

  COMMENT* DREDGE 324 WAS RENAMED DPW 224.

  REFERENCE* LETTER FROM C. COLP (DEPT. OF PUBLIC WORKS, EDMONTON) TO
       D. TAYLOR (DEPT. OF FISHERIES AND OCEANS, SIDNEY) 07/15/83.


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DATASET NUMBER* 61DPW-01
YEAR* 1961
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COMPANY & YEAR* PUBLIC WORKS CANADA 1961
DREDGE NAME* DPW 324
DREDGE TYPE* CUTTER SUCTION
PURPOSE* TUK HARBOUR AND CHANNEL MAINTENANCE
LOAD NAME* TUK HARBOUR, HUDSON BAY CO. WHARF
LOAD LAT* 69.450000
LOAD LON* 133.030000
LOAD MIN DEPTH* 1.5
LOAD MAX DEPTH* 2.0
LOAD SEDIMENT* CLAY, ROCK
DUMP NAME* TUK HARBOUR, HUDSON BAY CO. WHARF
DUMP LAT* 69.450000
DUMP LON* 133.030000
DUMP MIN DEPTH* INFORMATION NOT FOUND IN SEARCH
DUMP MAX DEPTH* INFORMATION NOT FOUND IN SEARCH
DUMP METHOD* PIPELINE DISCHARGE
DUMP SEDIMENT* CLAY, ROCK
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

START DATE*	07/07/1961
STOP DATE*	07/24/1961
LOAD VOL*	940
DUMP VOL*	940

COMMENT* LAT AND LON FOR DUMPSITE ARE APPROXIMATE.

COMMENT* DREDGE DPW 324 WAS RENAMED DPW 224.

REFERENCE* LETTER FROM C. COLP (DEPT. OF PUBLIC WORKS, EDMONTON) TO D. TAYLOR (DEPT. OF FISHERIES AND OCEANS, SIDNEY) 07/15/83.

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DATASET NUMBER* 61DPW-02
YEAR* 1961
COMPANY & YEAR* PUBLIC WORKS CANADA 1961
DREDGE NAME* DPW 324
DREDGE TYPE* CUTTER SUCTION
PURPOSE* TUK HARBOUR AND CHANNEL MAINTENANCE
LOAD NAME* TUK HARBOUR, NTCL CAMP
LOAD LAT* 69.430000
LOAD LON* 132.970000
LOAD MIN DEPTH* INFORMATION NOT FOUND IN SEARCH
LOAD MAX DEPTH* INFORMATION NOT FOUND IN SEARCH
LOAD SEDIMENT* GRAVEL, SAND
DUMP NAME* TUK HARBOUR, NTCL CAMP
DUMP LAT* 69.430000
DUMP LON* 132.960000
DUMP MIN DEPTH* INFORMATION NOT FOUND IN SEARCH
DUMP MAX DEPTH* INFORMATION NOT FOUND IN SEARCH

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DUMP METHOD* PIPELINE DISCHARGE
DUMP SEDIMENT* SAND, GRAVEL
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  07/07/1961
  STOP DATE*  07/24/1961
  LOAD VOL*       2008
  DUMP VOL*       2008

  COMMENT* LAT AND LON FOR DUMPSITE ARE APPROXIMATE.

  COMMENT* DREDGE DPW 324 WAS RENAMED DPW 224.

  REFERENCE* LETTER FROM C. COLP (DEPT. OF PUBLIC WORKS, EDMONTON) TO
       D. TAYLOR (DEPT. OF FISHERIES AND OCEANS, SIDNEY) 07/15/83.


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DATASET NUMBER* 61DPW-03
YEAR* 1961
COMPANY & YEAR* PUBLIC WORKS CANADA 1961
DREDGE NAME* DPW 324
DREDGE TYPE* CUTTER SUCTION
PURPOSE* TUK HARBOUR AND CHANNEL MAINTENANCE
LOAD NAME* TUK EAST CHANNEL
LOAD LAT*  69.450000
LOAD LON* 132.980000
LOAD MIN DEPTH*   1.5
LOAD MAX DEPTH*   2.5
LOAD SEDIMENT* SAND, GRAVEL
DUMP NAME* TUK EAST CHANNEL
DUMP LAT*  69.450000
DUMP LON* 132.980000
DUMP MIN DEPTH*   INFORMATION NOT FOUND IN SEARCH
DUMP MAX DEPTH*   INFORMATION NOT FOUND IN SEARCH
DUMP METHOD* FLOATING PIPELINE
DUMP SEDIMENT* GRAVEL, SAND
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  07/07/1961
  STOP DATE*  07/24/1961
  LOAD VOL*       5659
  DUMP VOL*       5659

  COMMENT* LAT AND LON FOR DUMPSITE ARE APPROXIMATE.

  COMMENT* DREDGE DPW 324 WAS RENAMED DPW 224.
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REFERENCE* LETTER FROM C. COLP (DEPT. OF PUBLIC WORKS, EDMONTON) TO D. TAYLOR (DEPT. OF FISHERIES AND OCEANS, SIDNEY) 07/15/83.

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DATASET NUMBER* 72ARN-01
YEAR* 1972
COMPANY & YEAR* IMPERIAL/ESSO 1972
DREDGE NAME* ARCTIC NORTHERN
DREDGE TYPE* CUTTER SUCTION
PURPOSE* BARGE LOADING BASE AT RAE ISLAND
LOAD NAME* RAE ISLAND
LOAD LAT* 69.540000
LOAD LON* 135.100000
LOAD MIN DEPTH* .3
LOAD MAX DEPTH* 1.0
LOAD SEDIMENT* SAND
DUMP NAME* RAE ISLAND
DUMP LAT* 69.540000
DUMP LON* 135.100000
DUMP MIN DEPTH* .3
DUMP MAX DEPTH* 1.0
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* SAND
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

START DATE* 07/08/1972
STOP DATE* 07/11/1972
LOAD VOL* INFORMATION NOT FOUND IN SEARCH
DUMP VOL* INFORMATION NOT FOUND IN SEARCH

START DATE* 08/07/1972
STOP DATE* 08/09/1972
LOAD VOL* INFORMATION NOT FOUND IN SEARCH
DUMP VOL* INFORMATION NOT FOUND IN SEARCH

COMMENT* NO VOLUMES GIVEN.

REFERENCE* F.F. SLANEY AND COMPANY LTD., 1973. ENVIRONMENTAL IMPACT ASSESSMENT IMMERK ARTIFICIAL ISLAND CONSTRUCTION, MACKENZIE BAY, N.W.T. VOLUME 1, ENVIRONMENTAL STATEMENT. PREPARED FOR IMPERIAL OIL LTD., CALGARY. F.F. SLANEY AND COMPANY LTD.; VANCOUVER.

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DATASET NUMBER* 72ARN-02
YEAR* 1972

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COMPANY & YEAR* IMPERIAL/ESSO 1972
DREDGE NAME* ARCTIC NORTHERN
DREDGE TYPE* CUTTER SUCTION
PURPOSE* IMMERK B-48 ISLAND
LOAD NAME* IMMERK B-48 AREA
LOAD LAT*  69.620000
LOAD LON* 135.180000
LOAD MIN DEPTH*   3.3
LOAD MAX DEPTH*   3.3
LOAD SEDIMENT* SAND, SILT
DUMP NAME* IMMERK B-48 ISLAND
DUMP LAT*  69.620000
DUMP LON* 135.180000
DUMP MIN DEPTH*   3.3
DUMP MAX DEPTH*   3.3
DUMP METHOD* FLOATING PIPELINE
DUMP SEDIMENT* SILT, GRAVEL
ISLAND NAME* IMMERK B-48
ISLAND TYPE* SACRIFICIAL BEACH
ISLAND STATUS* ABANDONED 1974

  START DATE*  07/15/1972
  STOP DATE*  07/31/1972
  LOAD VOL*       69900
  DUMP VOL*       69900

  START DATE*  08/01/1972
  STOP DATE*  08/31/1972
  LOAD VOL*      127300
  DUMP VOL*      127300

  START DATE*  09/01/1972
  STOP DATE*  09/26/1972
  LOAD VOL*      106800
  DUMP VOL*      106800

  AUTHORITY REFERENCE* LAND USE PERMIT N71J003
  AMOUNT LICENSED*     INFORMATION NOT FOUND IN SEARCH
  TERM START*  06/30/1972
  TERM COMPLETE*  09/30/1972

  COMMENT* MONTHLY TOTALS ARE APPROXIMATE. THEY REPRESENT PORTIONS OF
     THE TOTAL VOLUME DREDGED (304000 M'3) IN THE GIVEN PERIOD.

  REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B.SMILEY (DEPT. OF FISHERIES
         AND OCEANS, SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL ISLAND SU
        MMARY SUPPLEMENT.

  REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

  REFERENCE* HOME OIL, ESSO, 1983. MACKENZIE DELTA - BEAUFORT SEA OFFSH
        ORE CONSTRUCTION.

  REFERENCE* JIM BUTLER, ESSO , PERSONAL COMMUNICATION, 1983.
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REFERENCE* F.F. SLANEY AND COMPANY LTD., 1973. ENVIRONMENTAL IMPACT
     ASSESSMENT IMMERK ARTIFICIAL ISLAND CONSTRUCTION, MACKENZIE BAY,
       N.W.T. VOLUME 1, ENVIRONMENTAL STATEMENT. PREPARED FOR IMPERIA
         OIL LTD., CALGARY. F.F. SLANEY AND COMPANY.; VANCOUVER.


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DATASET NUMBER* 73ARN-01
YEAR* 1973
COMPANY & YEAR* IMPERIAL/ESSO 1973
DREDGE NAME* ARCTIC NORTHERN
DREDGE TYPE* CUTTER SUCTION
PURPOSE* IMMERK B-48 ISLAND
LOAD NAME* IMMERK B-48 AREA
LOAD LAT*  69.620000
LOAD LON* 135.180000
LOAD MIN DEPTH*   3.3
LOAD MAX DEPTH*   3.3
LOAD SEDIMENT* SILT,GRAVEL
DUMP NAME* IMMERK B-48 ISLAND
DUMP LAT*  69.620000
DUMP LON* 135.180000
DUMP MIN DEPTH*   3.3
DUMP MAX DEPTH*   3.3
DUMP METHOD* FLOATING PIPELINE
DUMP SEDIMENT* SILT,GRAVEL
ISLAND NAME* IMMERK B-48
ISLAND TYPE* SACRIFICIAL BEACH
ISLAND STATUS* ABANDONED 1974

  START DATE*  07/07/1973
  STOP DATE*  07/31/1973
  LOAD VOL*      112800
  DUMP VOL*       72580

  START DATE*  08/01/1973
  STOP DATE*  08/31/1973
  LOAD VOL*      139900
  DUMP VOL*       90000

  START DATE*  09/01/1973
  STOP DATE*  09/06/1973
  LOAD VOL*       27100
  DUMP VOL*       17420

  COMMENT* MONTHLY TOTALS ARE APPROXIMATE. THEY REPRESENT PORTIONS OF
       THE TOTAL VOLUME DREDGED (279,800 M'3) IN THE GIVEN PERIOD.

  REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

  REFERENCE* F.F. SLANEY AND COMPANY LTD., 1973. ENVIRONMENTAL IMPACT A
        SSESSMENT IMMERK ARTIFICIAL ISLAND CONSTRUCTION, MACKENZIE BAY,
      N.W.T. VOLUME 1, ENVIRONMENTAL STATEMENT. PREPARED FOR IMPERIAL
      OIL LTD., CALGARY. F.F. SLANEY AND COMPANY LTD.; VANCOUVER.


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DATASET NUMBER* 73UNK-01
YEAR* 1973
COMPANY & YEAR* IMPERIAL/ESSO 1973
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* CLAMSHELL AND BARGE
PURPOSE* ADGO F-28 ISLAND
LOAD NAME* IMMERK B-48 AREA
LOAD LAT*  69.620000
LOAD LON* 135.180000
LOAD MIN DEPTH*   3.0
LOAD MAX DEPTH*   3.3
LOAD SEDIMENT* GRAVEL
DUMP NAME* ADGO F-28 ISLAND
DUMP LAT*  69.450000
DUMP LON* 135.850000
DUMP MIN DEPTH*   2.3
DUMP MAX DEPTH*   2.3
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* GRAVEL
ISLAND NAME* ADGO F-28
ISLAND TYPE* SANDBAG RETAINED
ISLAND STATUS* ABANDONED 1974

  START DATE*  08/29/1973
  STOP DATE*  08/31/1973
  LOAD VOL*       2930
  DUMP VOL*       2640

  START DATE*  09/01/1973
  STOP DATE*  09/19/1973
  LOAD VOL*      18570
  DUMP VOL*      16710


  AUTHORITY REFERENCE* LAND USE PERMIT N73J419
  AMOUNT LICENSED*       3822
  TERM START*  08/08/1973
  TERM COMPLETE*  12/15/1973

  REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

  REFERENCE* HOME OIL, ESSO, 1983. MACKENZIE DELTA - BEAUFORT SEA OFFSH
       ORE CONSTRUCTION.

  REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF
      FISHERIES AND OCEANS,SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL
      ISLAND SUMMARY SUPPLEMENT.
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DATASET NUMBER* 73UNK-02
YEAR* 1973
COMPANY & YEAR* IMPERIAL/ESSO 1973
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* CLAMSHELL AND BARGE
PURPOSE* ADGO F-28 ISLAND
LOAD NAME* ADGO F-28 ISLAND
LOAD LAT* 69.450000
LOAD LON* 135.850000
LOAD MIN DEPTH* 2.0
LOAD MAX DEPTH* 2.0
LOAD SEDIMENT* SAND
DUMP NAME* ADGO F-28 ISLAND
DUMP LAT* 69.450000
DUMP LON* 135.850000
DUMP MIN DEPTH* 2.3
DUMP MAX DEPTH* 2.3
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* SAND
ISLAND NAME* ADGO F-28
ISLAND TYPE* SANDBAG RETAINED
ISLAND STATUS* ABANDONED 1974

START DATE* 08/29/1973
STOP DATE* 08/31/1973
LOAD VOL* 2930
DUMP VOL* 2640

START DATE* 09/01/1973
STOP DATE* 09/19/1973
LOAD VOL* 18570
DUMP VOL* 16710

AUTHORITY REFERENCE* LAND USE PERMIT N73J419
AMOUNT LICENSED* 3822
TERM START* 08/08/1973
TERM COMPLETE* 12/15/1973

REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF FISHERIES AND OCEANS,SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL ISLAND SUMMARY SUPPLEMENT.

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DATASET NUMBER* 74ARN-01

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YEAR* 1974
COMPANY & YEAR* IMPERIAL/ESSO 1974
DREDGE NAME* ARCTIC NORTHERN
DREDGE TYPE* CUTTER SUCTION
PURPOSE* NETSERK NORTH-40 (NETSERK F-40)
LOAD NAME* GARRY SPIT
LOAD LAT*  69.520000
LOAD LON* 135.670000
LOAD MIN DEPTH*   1.6
LOAD MAX DEPTH*   1.8
LOAD SEDIMENT* SAND, GRAVEL
DUMP NAME* NETSERK NORTH-40 ISLAND
DUMP LAT*  69.660000
DUMP LON* 135.900000
DUMP MIN DEPTH*   7.0
DUMP MAX DEPTH*   7.0
DUMP METHOD* BARGE
DUMP SEDIMENT* GRAVEL
ISLAND NAME* NETSERK NORTH-40
ISLAND TYPE* SANDBAG RETAINED
ISLAND STATUS* ABANDONED SEPTEMBER 1976

  START DATE*  08/16/1974
  STOP DATE*  08/22/1974
  LOAD VOL*        8100
  DUMP VOL*        8100

  START DATE*  08/23/1974
  STOP DATE*  08/31/1974
  LOAD VOL*        7120
  DUMP VOL*        7120

  START DATE*  09/01/1974
  STOP DATE*  09/07/1974
  LOAD VOL*        8490
  DUMP VOL*        8490

  START DATE*  09/08/1974
  STOP DATE*  09/08/1974
  LOAD VOL*         250
  DUMP VOL*         250

  REFERENCE* HOME OIL, ESSO, 1983. MACKENZIE DELTA - BEAUFORT SEA OFFSH
        ORE CONSTRUCTION.

  REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

  REFERENCE* IMPERIAL OIL LTD., 1974. CONSTRUCTION OF DREDGED DRILLING
        ISLANDS FOR NETSERK B-44 AND ADGO P-25 WELLS, BEAUFORT SEA,1974.

  REFERENCE* MPERIAL OIL LTD. 1974. CONSTRUCTION OF DREDGED DRILLING I
        ISLANDS FOR NETSERK B-44 AND IKATTOK J-17. IMPERIAL OIL LTD., CA
        LGARY.
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DATASET NUMBER* 74ARN-02
YEAR* 1974
COMPANY & YEAR* IMPERIAL/ESSO 1974
DREDGE NAME* ARCTIC NORTHERN
DREDGE TYPE* CUTTER SUCTION
PURPOSE* NETSERK B-44 ISLAND
LOAD NAME* PELLY ISLAND
LOAD LAT*  69.500000
LOAD LON* 135.750000
LOAD MIN DEPTH*   4.6
LOAD MAX DEPTH*   4.6
LOAD SEDIMENT* SAND, GRAVEL
DUMP NAME* NETSERK B-44 ISLAND
DUMP LAT*  69.550000
DUMP LON* 135.930000
DUMP MIN DEPTH*   4.6
DUMP MAX DEPTH*   4.6
DUMP METHOD* BARGE
DUMP SEDIMENT* SAND, GRAVEL
ISLAND NAME* NETSERK B-44
ISLAND TYPE* SANDBAG RETAINED
ISLAND STATUS* ABANDONED JULY 1976

  START DATE*  07/16/1974
  STOP DATE*  07/31/1974
  LOAD VOL*       78160
  DUMP VOL*       70350

  START DATE*  08/01/1974
  STOP DATE*  08/31/1974
  LOAD VOL*      151450
  DUMP VOL*      136310

  START DATE*  09/01/1974
  STOP DATE*  09/21/1974
  LOAD VOL*      102590
  DUMP VOL*       92340

  AUTHORITY REFERENCE* LAND USE PERMIT N74A790
  AMOUNT LICENSED*            0
  TERM START*  07/02/1974
  TERM COMPLETE*  09/15/1975

 COMMENT* MONTHLY TOTALS ARE APPROXIMATE. THEY REPRESENT PORTIONS OF THE
          TOTAL VOLUME DREDGED (332200 M'3) IN THE GIVEN PERIOD.

  REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF
       FISHERIES AND OCEANS,SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL
       ISLAND SUMMARY SUPPLEMENT.
```

REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

REFERENCE* IMPERIAL OIL LTD., 1974. CONSTRUCTION OF DREDGED DRILLING ISLANDS FOR NETSERK B-44 AND IKATTOK J-17, BEAUFORT SEA,1974 .

REFERENCE* IMPERIAL OIL LTD. 1974. CONSTRUCTION OF DREDGED DRILLING ISLANDS FOR NETSERK B-44 AND ADGO P-25 WELLS. IMPERIAL OIL LTD., CALGARY.

REFERENCE* HOME OIL, ESSO, 1983. MACKENZIE DELTA - BEAUFORT SEA OFFSHORE CONSTRUCTION.

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DATASET NUMBER* 74UNK-01
YEAR* 1974
COMPANY & YEAR* IMPERIAL/ESSO 1974
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* CLAMSHELL AND BARGE
PURPOSE* ADGO P-25 ISLAND
LOAD NAME* ADGO P-25 AREA
LOAD LAT* 69.420000
LOAD LON* 135.840000
LOAD MIN DEPTH* 1.5
LOAD MAX DEPTH* 1.5
LOAD SEDIMENT* SILT
DUMP NAME* ADGO P-25 ISLAND
DUMP LAT* 69.420000
DUMP LON* 135.840000
DUMP MIN DEPTH* 1.5
DUMP MAX DEPTH* 1.5
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* SILT
ISLAND NAME* ADGO P-25
ISLAND TYPE* SANDBAG RETAINED
ISLAND STATUS* ABANDONED 1975

START DATE* 08/26/1974
STOP DATE* 08/31/1974
LOAD VOL* 6820
DUMP VOL* 6130

START DATE* 09/01/1974
STOP DATE* 09/21/1974
LOAD VOL* 23880
DUMP VOL* 21470

AUTHORITY REFERENCE* LAND USE PERMIT N74A810
AMOUNT LICENSED* INFORMATION NOT FOUND IN SEARCH
TERM START* 08/08/1973

TERM COMPLETE* 12/15/1973

REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF FISHERIES AND OCEANS,SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL ISLAND SUMMARY SUPPLEMENT.

REFERENCE* IMPERIAL OIL LTD. 1974. CONSTRUCTION OF DREDGED DRILLING ISLANDS FOR NETSERK B-44 AND IKATTOK J-17. IMPERIAL OIL LTD., CALGARY.

REFERENCE* IMPERIAL OIL LTD., 1974. CONSTRUCTION OF DREDGED DRILLING ISLANDS FOR NETSERK B-44 AND ADGO P-25 WELLS, BEAUFORT SEA, 1974.

REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

REFERENCE* WOODWARD-CLYDE CONSULTANTS, 1982. BEAUFORT SEA SEDIMENT DYNAMICS. PREPARED FOR GEOLOGICAL SURVEY OF CANADA, BEDFORD INSTITUTE OF OCEANOGRAPHY, DARTMOUTH, N.S..WOODWARD-CLYDE CONSULTANTS, VICTORIA.

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DATASET NUMBER* 74UNK-02
YEAR* 1974
COMPANY & YEAR* IMPERIAL/ESSO 1974
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* INFORMATION NOT FOUND IN SEARCH
PURPOSE* PULLEN E-17 ISLAND
LOAD NAME* YAYA LAKES
LOAD LAT* NOT APPLICABLE
LOAD LON* NOT APPLICABLE
LOAD MIN DEPTH* NOT APPLICABLE
LOAD MAX DEPTH* NOT APPLICABLE
LOAD SEDIMENT* GRAVEL
DUMP NAME* PULLEN E-17 ISLAND
DUMP LAT* 69.770000
DUMP LON* 134.330000
DUMP MIN DEPTH* 1.6
DUMP MAX DEPTH* 1.6
DUMP METHOD* TRUCK
DUMP SEDIMENT* GRAVEL
ISLAND NAME* PULLEN E-17
ISLAND TYPE* SANDBAG RETAINED
ISLAND STATUS* ABANDONED JULY 1976

START DATE* 02/01/1974
STOP DATE* 02/28/1974
LOAD VOL* 32100
DUMP VOL* 29180

START DATE* 03/01/1974
STOP DATE* 03/31/1974

LOAD VOL* 35500
DUMP VOL* 32320

AUTHORITY REFERENCE* LAND USE PERMIT N73A652
AMOUNT LICENSED* 61164
TERM START* 02/01/1974
TERM COMPLETE* 12/31/1974

COMMENT* MONTHLY TOTALS ARE APPROXIMATE. THEY REPRESENT PORTIONS OF THE TOTAL VOLUME DREDGED (67600 M'3) IN THE GIVEN PERIOD.

REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

REFERENCE* HOME OIL, ESSO, 1983. MACKENZIE DELTA - BEAUFORT SEA OFFSHORE CONSTRUCTION.

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DATASET NUMBER* 74UNK-03
YEAR* 1974
COMPANY & YEAR* SUN OIL 1974
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* CLAMSHELL AND BARGE
PURPOSE* PELLY B-35 ISLAND
LOAD NAME* YAYA LAKES
LOAD LAT* NOT APPLICABLE
LOAD LON* NOT APPLICABLE
LOAD MIN DEPTH* NOT APPLICABLE
LOAD MAX DEPTH* NOT APPLICABLE
LOAD SEDIMENT* GRAVEL
DUMP NAME* PELLY B-35 ISLAND
DUMP LAT* 69.570000
DUMP LON* 135.390000
DUMP MIN DEPTH* 2.0
DUMP MAX DEPTH* 2.0
DUMP METHOD* BARGE
DUMP SEDIMENT* GRAVEL
ISLAND NAME* PELLY B-35
ISLAND TYPE* SANDBAG RETAINED
ISLAND STATUS* ABANDONED 1975

START DATE* 01/01/1974
STOP DATE* 01/01/1900
LOAD VOL* 8054
DUMP VOL* 8054

AUTHORITY REFERENCE* LAND USE PERMIT N74A792
AMOUNT LICENSED* INFORMATION NOT FOUND IN SEARCH
TERM START* 02/14/1974
TERM COMPLETE* 10/15/1974

REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

REFERENCE* WOODWARD-CLYDE CONSULTANTS, 1982. BEAUFORT SEA SEDIMENT DYNAMICS. PREPARED FOR GEOLOGICAL SURVEY OF CANADA, BEDFORD INSTITUTE OF OCEANOGRAPHY, DARTMOUTH, N.S..WOODWARD-CLYDE CONSULTANTS, VICTORIA.

REFERENCE* SWAN WOOSTER ENGINEERING CO. LTD., 1982. ENVIRONMENTAL IMPACT STATEMENT; STUDY OF PRODUCTION STRUCTURES, BEAUFORT SEA OIL FIELD DEVELOPEMENT. PREPARED FOR DOME PETROLEUM LTD., ESSO RESOURCES CANADA LTD., GULF CANADA RESOURCES INC., AUGUST 1982.

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DATASET NUMBER* 74UNK-04
YEAR* 1974
COMPANY & YEAR* SUN OIL 1974
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* INFORMATION NOT FOUND IN SEARCH
PURPOSE* UNARK L-24 ISLAND
LOAD NAME* YAYA LAKES
LOAD LAT* NOT APPLICABLE
LOAD LON* NOT APPLICABLE
LOAD MIN DEPTH* NOT APPLICABLE
LOAD MAX DEPTH* NOT APPLICABLE
LOAD SEDIMENT* GRAVEL
DUMP NAME* UNARK L-24 ISLAND
DUMP LAT* 69.560000
DUMP LON* 134.620000
DUMP MIN DEPTH* 2.0
DUMP MAX DEPTH* 2.0
DUMP METHOD* TRUCK
DUMP SEDIMENT* GRAVEL
ISLAND NAME* UNARK L-24
ISLAND TYPE* SANDBAG RETAINED
ISLAND STATUS* ABANDONED 1976

START DATE* 01/01/1974
STOP DATE* 01/01/1900
LOAD VOL* 45078
DUMP VOL* 45078

AUTHORITY REFERENCE* LAND USE PERMIT N74J698
AMOUNT LICENSED* INFORMATION NOT FOUND IN SEARCH
TERM START* 07/02/1974
TERM COMPLETE* 05/01/1975

REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

REFERENCE* SWAN WOOSTER ENGINEERING CO. LTD., 1982. ENVIRONMENTAL IMPACT STATEMENT; STUDY OF PRODUCTION STRUCTURES, BEAUFORT SEA OIL FIELD DEVELOPEMENT. PREPARED FOR DOME PETROLEUM LTD., ESSO RESOURCES CANADA LTD., GULF CANADA RESOURCES INC., AUGUST 1982.

REFERENCE* WOODWARD-CLYDE CONSULTANTS, 1982. BEAUFORT SEA SEDIMENT DYNAMICS. PREPARED FOR GEOLOGICAL SURVEY OF CANADA, BEDFORD INSTITUTE OF OCEANOGRAPHY, DARTMOUTH, N.S..WOODWARD-CLYDE CONSULTANTS, VICTORIA.

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DATASET NUMBER* 75ARN-01
YEAR* 1975
COMPANY & YEAR* IMPERIAL/ESSO 1975
DREDGE NAME* ARCTIC NORTHERN
DREDGE TYPE* CUTTER SUCTION
PURPOSE* NETSERK NORTH-40 ISLAND
LOAD NAME* GARRY HARBOUR
LOAD LAT* 69.500000
LOAD LON* 135.750000
LOAD MIN DEPTH* 1.8
LOAD MAX DEPTH* 1.8
LOAD SEDIMENT* INFORMATION NOT FOUND IN SEARCH
DUMP NAME* NETSERK NORTH-40 ISLAND
DUMP LAT* 69.660000
DUMP LON* 135.900000
DUMP MIN DEPTH* 7.0
DUMP MAX DEPTH* 7.0
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* INFORMATION NOT FOUND IN SEARCH
ISLAND NAME* NETSERK NORTH-40
ISLAND TYPE* SANDBAG RETAINED
ISLAND STATUS* ABANDONED JULY 1976

START DATE* 07/02/1975
STOP DATE* 07/12/1975
LOAD VOL* 70530
DUMP VOL* 45460

REFERENCE* IMPERIAL OIL LTD., 1975. REPORT OF 1975 SUMMER OFFSHORE CONSTRUCTION PROJECT.IOL PRODUCING DEPARTMENT, WESTERN REGION, OFFSHORE GROUP. FIELD SERVICES DEPARTMENT; EDMONTON.

REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF FISHERIES AND OCEANS,SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL ISLAND SUMMARY SUPPLEMENT.

REFERENCE* IMPERIAL OIL LTD. 1974. CONSTRUCTION OF DREDGED DRILLING ISLANDS FOR NETSERK B-44 AND IKATTOK J-17. IMPERIAL OIL LTD., CALGARY.

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DATASET NUMBER* 75ARN-02
YEAR* 1975
COMPANY & YEAR* IMPERIAL/ESSO 1975
DREDGE NAME* ARCTIC NORTHERN
DREDGE TYPE* CUTTER SUCTION
PURPOSE* NETSERK NORTH-40 (NETSERK F-40)
LOAD NAME* PELLY PIT
LOAD LAT*  69.580000
LOAD LON* 135.420000
LOAD MIN DEPTH*   3.2
LOAD MAX DEPTH*   4.4
LOAD SEDIMENT* SAND
DUMP NAME* NETSERK NORTH-40 ISLAND
DUMP LAT*  69.660000
DUMP LON* 135.900000
DUMP MIN DEPTH*   7.6
DUMP MAX DEPTH*   7.6
DUMP METHOD* BARGE
DUMP SEDIMENT* SAND
ISLAND NAME* NETSERK NORTH-40
ISLAND TYPE* SANDBAG RETAINED
ISLAND STATUS*  ABANDONED JULY 1979

  START DATE*  07/19/1975
  STOP DATE*  07/30/1975
  LOAD VOL*     188312
  DUMP VOL*     122912

  START DATE*  08/01/1975
  STOP DATE*  01/01/1901
  LOAD VOL*      51698
  DUMP VOL*      33168

  AUTHORITY REFERENCE* LAND USE PERMIT N74A795
  AMOUNT LICENSED*     592000
  TERM START*  07/02/1974
  TERM COMPLETE*  10/01/1976

  REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF
       FISHERIES AND OCEANS,SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL
       ISLAND SUMMARY SUPPLEMENT.

  REFERENCE* IMPERIAL OIL LTD., 1975. REPORT OF 1975 SUMMER OFFSHORE CO
        NSTRUCTION PROJECT.IOL PRODUCING DEPARTMENT, WESTERN REGION, OF
        FSHORE GROUP. FIELD SERVICES DEPARTMENT; EDMONTON.

  REFERENCE* IMPERIAL OIL LTD. 1974. CONSTRUCTION OF DREDGED DRILLING
        ISLANDS FOR NETSERK B-44 AND IKATTOK J-17. IMPERIAL OIL LTD., CA
        LGARY.


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DATASET NUMBER* 75UNK-01
YEAR* 1975
COMPANY & YEAR* IMPERIAL/ESSO 1975
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* CLAMSHELL AND BARGE
PURPOSE* IKATTOK J-17 ISLAND
LOAD NAME* YAYA LAKES
LOAD LAT* NOT APPLICABLE
LOAD LON* NOT APPLICABLE
LOAD MIN DEPTH* NOT APPLICABLE
LOAD MAX DEPTH* NOT APPLICABLE
LOAD SEDIMENT* GRAVEL
DUMP NAME* IKATTOK J-17 ISLAND
DUMP LAT* 69.280000
DUMP LON* 136.300000
DUMP MIN DEPTH* 2.0
DUMP MAX DEPTH* 2.0
DUMP METHOD* BARGE
DUMP SEDIMENT* GRAVEL
ISLAND NAME* IKATTOK J-17
ISLAND TYPE* SANDBAG RETAINED
ISLAND STATUS* ABANDONED JULY 1976

START DATE* 07/01/1975
STOP DATE* 07/31/1975
LOAD VOL* 37600
DUMP VOL* 33900

START DATE* 01/01/1975
STOP DATE* 01/01/1900
LOAD VOL* 0
DUMP VOL* 37000

AUTHORITY REFERENCE* LAND USE PERMIT N75A080
AMOUNT LICENSED* 52050
TERM START* 06/26/1975
TERM COMPLETE* 06/26/1975

REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF FISHERIES AND OCEANS,SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL ISLAND SUMMARY SUPPLEMENT.

REFERENCE* IMPERIAL OIL LTD. 1975. REPORT OF 1975 SUMMER OFFSHORE CONSTRUCTION PROJECT. OIL PRODUCING DEPARTMENT, WESTERN REGION, OFFSHORE GROUP. FIELD SERVICES DEPARTMENT, EDMONTON.

REFERENCE* HOME OIL, ESSO, 1983. MACKENZIE DELTA - BEAUFORT SEA OFFSHORE CONSTRUCTION.

REFERENCE* WOODWARD-CLYDE CONSULTANTS, 1982. BEAUFORT SEA SEDIMENT DYNAMICS. PREPARED FOR GEOLOGICAL SURVEY OF CANADA, BEDFORD INSTITUTE OF OCEANOGRAPHY, DARTMOUTH, N.S..WOODWARD-CLYDE CONSULTANT

S, VICTORIA.

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DATASET NUMBER* 75UNK-02
YEAR* 1975
COMPANY & YEAR* IMPERIAL/ESSO 1975
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* INFORMATION NOT FOUND IN SEARCH
PURPOSE* ADGO C-15 ISLAND
LOAD NAME* YAYA LAKES
LOAD LAT* NOT APPLICABLE
LOAD LON* NOT APPLICABLE
LOAD MIN DEPTH* NOT APPLICABLE
LOAD MAX DEPTH* NOT APPLICABLE
LOAD SEDIMENT* GRAVEL
DUMP NAME* ADGO C-15 ISLAND
DUMP LAT* 69.400000
DUMP LON* 135.820000
DUMP MIN DEPTH* 2.0
DUMP MAX DEPTH* 2.0
DUMP METHOD* TRUCK
DUMP SEDIMENT* GRAVEL
ISLAND NAME* ADGO C-15
ISLAND TYPE* SANDBAG RETAINED
ISLAND STATUS* ABANDONED JULY 1976

START DATE* 02/05/1975
STOP DATE* 02/28/1975
LOAD VOL* 40040
DUMP VOL* 36050

START DATE* 03/01/1975
STOP DATE* 03/20/1975
LOAD VOL* 33360
DUMP VOL* 30050

AUTHORITY REFERENCE* LAND USE PERMIT N74A956
AMOUNT LICENSED* 81677
TERM START* 01/29/1975
TERM COMPLETE* 01/29/1977

REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

REFERENCE* IMPERIAL OIL LTD., 1975. REPORT OF 1975 SUMMER OFFSHORE CONSTRUCTION PROJECT.OIL PRODUCING DEPARTMENT, WESTERN REGION, OFFSHORE GROUP. FIELD SERVICES DEPARTMENT, EDMONTON.

REFERENCE* LETTER FROM D. BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF FISHERIES AND OCEANS, SIDNEY) RE: ARCTIC ARTIFICIAL ISLAND CONSTRUCTION SUMMARY SUPPLEMENT.

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DATASET NUMBER* 76ARN-01
YEAR* 1976
COMPANY & YEAR* IMPERIAL/ESSO 1976
DREDGE NAME* ARCTIC NORTHERN
DREDGE TYPE* CUTTER SUCTION
PURPOSE* KUGMALLIT H-59 ISLAND
LOAD NAME* TUFT POINT
LOAD LAT*  69.670000
LOAD LON* 132.650000
LOAD MIN DEPTH*  15.0
LOAD MAX DEPTH*  15.0
LOAD SEDIMENT* SAND
DUMP NAME* KUGMALLIT H-59 ISLAND
DUMP LAT*  69.640000
DUMP LON* 133.460000
DUMP MIN DEPTH*   5.5
DUMP MAX DEPTH*   5.5
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* SAND
ISLAND NAME* KUGMALLIT H-59
ISLAND TYPE* SANDBAG RETAINED
ISLAND STATUS* ABANDONED JUNE 1977

  START DATE*  07/18/1976
  STOP DATE*  07/23/1976
  LOAD VOL*      41520
  DUMP VOL*      34175

  START DATE*  07/24/1976
  STOP DATE*  07/31/1976
  LOAD VOL*      41520
  DUMP VOL*      34175

  START DATE*  08/01/1976
  STOP DATE*  08/31/1976
  LOAD VOL*     183870
  DUMP VOL*     151350

  START DATE*  09/01/1976
  STOP DATE*  09/06/1976
  LOAD VOL*      35590
  DUMP VOL*      29300

  AUTHORITY REFERENCE* LAND USE PERMIT N75A058
  AMOUNT LICENSED*     220193
  TERM START*  07/01/1976
  TERM COMPLETE*  06/30/1978

  COMMENT* WEEKLY TOTALS ARE APPROXIMATE. THEY REPRESENT PORTIONS OF TH
       E TOTAL VOLUME DREDGED (302500 M'3) IN THE GIVEN PERIOD.
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REFERENCE* IMPERIAL OIL LTD., 1977. REPORT ON THE 1976 ARCTIC OFFSHORE CONSTRUCTION PROGRAM. PRODUCTION DEPARTMENT, WESTERN REGION, OFFSHORE CONSTRUCTION GROUP. FIELD SERVICES, EDMONTON.

REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

REFERENCE* WOODWARD-CLYDE CONSULTANTS, 1982. BEAUFORT SEA SEDIMENT DYNAMICS. PREPARED FOR GEOLOGICAL SURVEY OF CANADA, BEDFORD INSTITUTE OF OCEANOGRAPHY, DARTMOUTH, N.S..WOODWARD-CLYDE CONSULTANTS, VICTORIA.

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DATASET NUMBER* 76ARN-02
YEAR* 1976
COMPANY & YEAR* IMPERIAL/ESSO 1976
DREDGE NAME* ARCTIC NORTHERN
DREDGE TYPE* CUTTER SUCTION
PURPOSE* ADGO J-27 ISLAND
LOAD NAME* NETSERK B-44 AREA
LOAD LAT* 69.550000
LOAD LON* 135.800000
LOAD MIN DEPTH* 4.6
LOAD MAX DEPTH* 4.6
LOAD SEDIMENT* GRAVEL, SAND
DUMP NAME* ADGO J-27 ISLAND
DUMP LAT* 69.440000
DUMP LON* 135.850000
DUMP MIN DEPTH* 1.8
DUMP MAX DEPTH* 1.8
DUMP METHOD* BARGE
DUMP SEDIMENT* GRAVEL,SAND
ISLAND NAME* ADGO J-27
ISLAND TYPE* SANDBAG RETAINED
ISLAND STATUS* ABANDONED SEPTEMBER 1977

START DATE* 08/23/1976
STOP DATE* 08/31/1976
LOAD VOL* 17720
DUMP VOL* 13650

START DATE* 09/01/1976
STOP DATE* 09/07/1976
LOAD VOL* 13783
DUMP VOL* 10620

START DATE* 09/08/1976
STOP DATE* 09/14/1976
LOAD VOL* 13783
DUMP VOL* 10620

START DATE* 09/15/1976
STOP DATE* 09/20/1976
LOAD VOL* 11814
DUMP VOL* 9110

COMMENT* ALSO TOOK 40000 M'3 OF GRAVEL FROM YAYA LAKES.

REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF FISHERIES AND OCEANS,SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL ISLAND SUMMARY SUPPLEMENT.

REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

REFERENCE* WOODWARD-CLYDE CONSULTANTS, 1982. BEAUFORT SEA SEDIMENT DYNAMICS. PREPARED FOR GEOLOGICAL SURVEY OF CANADA, BEDFORD INSTITUTE OF OCEANOGRAPHY, DARTMOUTH, N.S..WOODWARD-CLYDE CONSULTANTS, VICTORIA.

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DATASET NUMBER* 76ARN-03
YEAR* 1976
COMPANY & YEAR* IMPERIAL/ESSO 1976
DREDGE NAME* ARCTIC NORTHERN
DREDGE TYPE* CUTTER SUCTION
PURPOSE* ISSERK H-47 ISLAND
LOAD NAME* ISSERK H-47
LOAD LAT* 69.830000
LOAD LON* 134.430000
LOAD MIN DEPTH* 13.0
LOAD MAX DEPTH* 1.3
LOAD SEDIMENT* INFORMATION NOT FOUND IN SEARCH
DUMP NAME* ISSERK H-47 ISLAND
DUMP LAT* 69.830000
DUMP LON* 134.430000
DUMP MIN DEPTH* 13.0
DUMP MAX DEPTH* 13.0
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* INFORMATION NOT FOUND IN SEARCH
ISLAND NAME* ISSERK H-47
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* OPERATION CANCELLED

START DATE* 09/03/1976
STOP DATE* 09/07/1976
LOAD VOL* 13380
DUMP VOL* 13380

START DATE* 09/08/1976
STOP DATE* 09/14/1976
LOAD VOL* 29817
DUMP VOL* 29817

START DATE* 09/15/1976
STOP DATE* 09/22/1976
LOAD VOL* 45109
DUMP VOL* 45109

START DATE* 09/23/1976
STOP DATE* 09/30/1976
LOAD VOL* 31728
DUMP VOL* 31728

START DATE* 10/07/1976
STOP DATE* 10/07/1976
LOAD VOL* 38610
DUMP VOL* 38610

COMMENT* DUMP LAT AND LON ARE APPROXIMATE.

REFERENCE* DREDGING LICENSE APPLICATION FROM M. SHAW (ESSO) TO J. DUN
LOP (DIAND) 07/04/83.

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DATASET NUMBER* 76ARN-04
YEAR* 1976
COMPANY & YEAR* IMPERIAL/ESSO 1976
DREDGE NAME* ARCTIC NORTHERN
DREDGE TYPE* CUTTER SUCTION
PURPOSE* TUFT POINT BREAKWATER
LOAD NAME* TUFT POINT
LOAD LAT* 69.670000
LOAD LON* 132.650000
LOAD MIN DEPTH* 4.3
LOAD MAX DEPTH* 4.6
LOAD SEDIMENT* SAND, SILT
DUMP NAME* TUFT POINT
DUMP LAT* 69.670000
DUMP LON* 132.650000
DUMP MIN DEPTH* 8.0
DUMP MAX DEPTH* 8.0
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* SAND, SILT
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

START DATE* 01/01/1976
STOP DATE* 01/01/1900
LOAD VOL* 350928
DUMP VOL* 350928

REFERENCE* IMPERIAL OIL LTD., 1977. REPORT ON THE 1976 ARCTIC OFFSHOR

E CONSTRUCTION PROGRAM. PRODUCTION DEPARTMENT, WESTERN REGION,
OFFSHORE CONSTRUCTION GROUP. FIELD SERVICES, EDMONTON.

REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

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DATASET NUMBER* 76BMZ-01
YEAR* 1976
COMPANY & YEAR* IMPERIAL/ESSO 1976
DREDGE NAME* BEAVER MACKENZIE
DREDGE TYPE* STATIONARY SUCTION
PURPOSE* TUFT POINT BREAKWATER
LOAD NAME* TUFT POINT
LOAD LAT* 69.670000
LOAD LON* 132.650000
LOAD MIN DEPTH* 4.3
LOAD MAX DEPTH* 4.6
LOAD SEDIMENT* SAND, SILT
DUMP NAME* TUFT POINT
DUMP LAT* 69.670000
DUMP LON* 132.650000
DUMP MIN DEPTH* 8.0
DUMP MAX DEPTH* 8.0
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* SAND, SILT
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

START DATE* 07/23/1976
STOP DATE* 07/22/1976
LOAD VOL* 180709
DUMP VOL* 180709

START DATE* 07/23/1976
STOP DATE* 07/25/1976
LOAD VOL* 222415
DUMP VOL* 222415

REFERENCE* LETTER FROM E. BENNETT (ESSO) TO A. REDSHAW (DIAND) 04/14/
83.

REFERENCE* DREDGING LICENSE APPLICATION FROM M. SHAW (ESSO) TO J. DUN
LOP (DIAND) 07/04/83.

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DATASET NUMBER* 76BMZ-02

YEAR* 1976
COMPANY & YEAR* IMPERIAL/ESSO 1976
DREDGE NAME* BEAVER MACKENZIE
DREDGE TYPE* STATIONARY SUCTION
PURPOSE* ARNAK L-30 ISLAND
LOAD NAME* ARNAK L-30 AREA
LOAD LAT* 69.830000
LOAD LON* 133.870000
LOAD MIN DEPTH* 8.5
LOAD MAX DEPTH* 8.5
LOAD SEDIMENT* SAND
DUMP NAME* ARNAK L-30 ISLAND
DUMP LAT* 69.830000
DUMP LON* 133.870000
DUMP MIN DEPTH* 8.5
DUMP MAX DEPTH* 8.5
DUMP METHOD* FLOATING PIPELINE
DUMP SEDIMENT* SAND, SILT
ISLAND NAME* ARNAK L-30
ISLAND TYPE* SACRIFICIAL BEACH
ISLAND STATUS* ABANDONED JUNE 1977

START DATE* 07/27/1976
STOP DATE* 07/31/1976
LOAD VOL* 179860
DUMP VOL* 156670

START DATE* 08/01/1976
STOP DATE* 08/31/1976
LOAD VOL* 1115140
DUMP VOL* 971330

START DATE* 09/02/1976
STOP DATE* 09/09/1976
LOAD VOL* 600000
DUMP VOL 570000

START DATE* 09/10/1976
STOP DATE* 09/18/1976
LOAD VOL* 600000
DUMP VOL* 570000

AUTHORITY REFERENCE* LAND USE PERMIT N75A981
AMOUNT LICENSED* 955698
TERM START* 07/01/1975
TERM COMPLETE* 06/30/1977

COMMENT* 1100952 M'3 SAND, 195 M'3 SILT.

REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF FISHERIES AND OCEANS,SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL ISLAND SUMMARY SUPPLEMENT.

REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

REFERENCE* IMPERIAL OIL LTD., 1977. REPORT ON THE 1976 ARCTIC OFFSHORE CONSTRUCTION PROGRAM. PRODUCTION DEPARTMENT, WESTERN REGION, OFFSHORE CONSTRUCTION GROUP. FIELD SERVICES, EDMONTON.

REFERENCE* WOODWARD-CLYDE CONSULTANTS, 1982. BEAUFORT SEA SEDIMENT DYNAMICS. PREPARED FOR GEOLOGICAL SURVEY OF CANADA, BEDFORD INSTITUTE OF OCEANOGRAPHY, DARTMOUTH, N.S..WOODWARD-CLYDE CONSULTANTS, VICTORIA.

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DATASET NUMBER* 76BMZ-03
YEAR* 1976
COMPANY & YEAR* IMPERIAL/ESSO 1976
DREDGE NAME* BEAVER MACKENZIE
DREDGE TYPE* STATIONARY SUCTION
PURPOSE* KANNERK G-42 ISLAND
LOAD NAME* KANNERK G-42 AREA
LOAD LAT* 70.020000
LOAD LON* 131.220000
LOAD MIN DEPTH* 8.5
LOAD MAX DEPTH* 8.5
LOAD SEDIMENT* SAND
DUMP NAME* KANNERK G-42 ISLAND
DUMP LAT* 70.020000
DUMP LON* 131.220000
DUMP MIN DEPTH* 8.5
DUMP MAX DEPTH* 8.5
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* SAND
ISLAND NAME* KANNERK G-42
ISLAND TYPE* SACRIFICIAL BEACH
ISLAND STATUS* ABANDONED 1977

START DATE* 09/02/1976
STOP DATE* 09/09/1976
LOAD VOL* 600000
DUMP VOL* 570000

START DATE* 09/10/1976
STOP DATE* 09/18/1976
LOAD VOL* 600000
DUMP VOL* 570000

AUTHORITY REFERENCE* LAND USE PERMIT N76A338
AMOUNT LICENSED* 1510768
TERM START* 09/01/1976
TERM COMPLETE* 09/07/1977

REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF FISHERIES AND OCEANS,SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL ISLAND SUMMARY SUPPLEMENT.

REFERENCE* IMPERIAL OIL LTD., 1977. REPORT ON THE 1976 ARCTIC OFFSHORE CONSTRUCTION PROGRAM. PRODUCTION DEPARTMENT, WESTERN REGION, OFFSHORE CONSTRUCTION GROUP. FIELD SERVICES; EDMONTON.

REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

REFERENCE* WOODWARD-CLYDE CONSULTANTS, 1982. BEAUFORT SEA SEDIMENT DYNAMICS. PREPARED FOR GEOLOGICAL SURVEY OF CANADA, BEDFORD INSTITUTE OF OCEANOGRAPHY, DARTMOUTH, N.S..WOODWARD-CLYDE CONSULTANTS, VICTORIA.

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DATASET NUMBER* 76UNK-01
YEAR* 1976
COMPANY & YEAR* IMPERIAL/ESSO 1976
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* INFORMATION NOT FOUND IN SEARCH
PURPOSE* SARPIK B-35 ISLAND
LOAD NAME* ADGO C-15 AREA
LOAD LAT* 69.400000
LOAD LON* 135.820000
LOAD MIN DEPTH* 1.5
LOAD MAX DEPTH* 2.0
LOAD SEDIMENT* GRAVEL
DUMP NAME* SARPIK B-35 ISLAND
DUMP LAT* 69.400000
DUMP LON* 136.390000
DUMP MIN DEPTH* 4.3
DUMP MAX DEPTH* 4.3
DUMP METHOD* TRUCK
DUMP SEDIMENT* GRAVEL
ISLAND NAME* SARPIK B-35
ISLAND TYPE* SANDBAG RETAINED
ISLAND STATUS* ABANDONED SEPTEMBER 1976

START DATE* 01/24/1976
STOP DATE* 01/31/1976
LOAD VOL* 15930
DUMP VOL* 14340

START DATE* 02/01/1976
STOP DATE* 02/29/1976
LOAD VOL* 66020
DUMP VOL* 59420

START DATE* 03/01/1976
STOP DATE* 03/15/1976
LOAD VOL* 34150
DUMP VOL* 30240

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    AUTHORITY REFERENCE* LAND USE PERMIT N75A183
    AMOUNT LICENSED*       94805
    TERM START*  01/15/1976
    TERM COMPLETE*  01/14/1978

    COMMENT* OTHER LOAD SITES ARE ON LAND.

    REFERENCE* IMPERIAL OIL LTD., 1976. CONSTRUCTION REPORT ON SARPIK B-3
          5. PRODUCING DEPARTMENT WESTERN REGION. FIELD SERVICES DEPARTME
          NT; EDMONTON.

    REFERENCE* HOME OIL, ESSO, 1983. MACKENZIE DELTA - BEAUFORT SEA OFFSH
          ORE CONSTRUCTION.

    REFERENCE* WOODWARD-CLYDE CONSULTANTS, 1982. BEAUFORT SEA SEDIMENT DY
          NAMICS. PREPARED FOR GEOLOGICAL SURVEY OF CANADA, BEDFORD INSTI
          TUTE OF OCEANOGRAPHY, DARTMOUTH  N.S..WOODWARD-CLYDE CONSULTANT
          S, VICTORIA.

    REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.


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  DATASET NUMBER* 76UNK-02
  YEAR* 1976
  COMPANY & YEAR* DOME/CANMAR 1976
  DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
  DREDGE TYPE* INFORMATION NOT FOUND IN SEARCH
  PURPOSE* TINGMIARK K-91 GLORY HOLE
  LOAD NAME* TINGMIARK K-91
  LOAD LAT*  70.180000
  LOAD LON* 132.980000
  LOAD MIN DEPTH*  28.0
  LOAD MAX DEPTH*  28.0
  LOAD SEDIMENT* INFORMATION NOT FOUND IN SEARCH
  DUMP NAME* NOT APPLICABLE
  DUMP LAT*   NOT APPLICABLE
  DUMP LON*   NOT APPLICABLE
  DUMP MIN DEPTH*   NOT APPLICABLE
  DUMP MAX DEPTH*   NOT APPLICABLE
  DUMP METHOD* NOT APPLICABLE
  DUMP SEDIMENT* NOT APPLICABLE
  ISLAND NAME* NOT APPLICABLE
  ISLAND TYPE* NOT APPLICABLE
  ISLAND STATUS* NOT APPLICABLE

    START DATE*  08/01/1976
    STOP DATE*  01/01/1901
    LOAD VOL*      18519
    DUMP VOL*      18519

    COMMENT* THIS VOLUME IS APPROXIMATE.
    REFERENCE* ED PESSAH, DOME, PERSONAL COMMUNICATION, 1983.

    REFERENCE* LETTER FROM M. THOMAS (COGLA, YELLOWKNIFE) TO M. REED (DEP
          T. OF FISHERIES AND OCEANS, SIDNEY) 07/06/83.


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DATASET NUMBER* 77ARN-01
YEAR* 1977
COMPANY & YEAR* IMPERIAL/ESSO 1977
DREDGE NAME* ARCTIC NORTHERN
DREDGE TYPE* CUTTER SUCTION
PURPOSE* TUK HARBOUR DOCK CONSTRUCTION AND FILL
LOAD NAME* TUK HARBOUR
LOAD LAT*   INFORMATION NOT FOUND IN SEARCH
LOAD LON*   INFORMATION NOT FOUND IN SEARCH
LOAD MIN DEPTH* INFORMATION NOT FOUND IN SEARCH
LOAD MAX DEPTH* INFORMATION NOT FOUND IN SEARCH
LOAD SEDIMENT* INFORMATION NOT FOUND IN SEARCH
DUMP NAME* TUK HARBOUR (LAND)
DUMP LAT*  69.420000
DUMP LON* 132.950000
DUMP MIN DEPTH*   NOT APPLICABLE
DUMP MAX DEPTH*   NOT APPLICABLE
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* INFORMATION NOT FOUND IN SEARCH
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  07/04/1977
  STOP DATE*  07/07/1977
  LOAD VOL*      10000
  DUMP VOL*      10000

  REFERENCE* IMPERIAL OIL LTD., 1977. PROJECT SUMMARY REPORT ISSERK E-2
        7. PRODUCTION DEPARTMENT, FRONTIER OPERATIONS, OFFSHORE CONSTRU
        CTION GROUP. FIELD SERVICES; EDMONTON.


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DATASET NUMBER* 77ARN-02
YEAR* 1977
COMPANY & YEAR* IMPERIAL/ESSO 1977
DREDGE NAME* ARCTIC NORTHERN
DREDGE TYPE* CUTTER SUCTION
PURPOSE* ISSERK E-27 ISLAND
LOAD NAME* TUFT POINT
LOAD LAT*  69.670000
LOAD LON* 132.650000
LOAD MIN DEPTH*   4.3
LOAD MAX DEPTH*   4.6
LOAD SEDIMENT* SAND
DUMP NAME* ISSERK E-27 ISLAND
DUMP LAT*  69.940000
DUMP LON* 134.370000
DUMP MIN DEPTH*  13.0
DUMP MAX DEPTH*  13.0
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* SAND
ISLAND NAME* ISSERK E-27
ISLAND TYPE* SACRIFICIAL BEACH
ISLAND STATUS* ABANDONED JULY 1978

  START DATE*  07/07/1977
  STOP DATE*  07/31/1977
  LOAD VOL*     141818
  DUMP VOL*      39758

  START DATE*  08/01/1977
  STOP DATE*  08/31/1977
  LOAD VOL*     183180
  DUMP VOL*      51355

  START DATE*  09/01/1977
  STOP DATE*  09/30/1977
  LOAD VOL*     177273
  DUMP VOL*      49697

  START DATE*  10/01/1977
  STOP DATE*  10/14/1977
  LOAD VOL*      82729
  DUMP VOL*      23190

  REFERENCE* DREDGING LICENSE APPLICATION FROM M. SHAW (ESSO) TO J. DUN
        LOP (DIAND) 07/04/83.

  REFERENCE* IMPERIAL OIL LTD., 1977. PROJECT SUMMARY REPORT ISSERK E-2
        7. PRODUCTION DEPARTMENT, FRONTIER OPERATIONS, OFFSHORE CONSTRU
        CTION GROUP. FIELD SERVICES; EDMONTON.

  REFERENCE* WOODWARD-CLYDE CONSULTANTS, 1982. BEAUFORT SEA SEDIMENT DY
        NAMICS. PREPARED FOR GEOLOGICAL SURVEY OF CANADA, BEDFORD INSTI
        TUTE OF OCEANOGRAPHY, DARTMOUTH, N.S..WOODWARD-CLYDE CONSULTANT
        S, VICTORIA.

  REFERENCE* LETTER FROM E. BENNETT (ESSO) TO A. REDSHAW (DIAND) 04/14/
        83.


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DATASET NUMBER* 77ARN-03
COMPANY & YEAR* IMPERIAL/ESSO 1977
DREDGE NAME* ARCTIC NORTHERN
DREDGE TYPE* CUTTER SUCTION
PURPOSE* TUFT POINT BREAKWATER
LOAD NAME* TUFT POINT
LOAD LAT*  69.670000
LOAD LON* 132.650000
LOAD MIN DEPTH*   4.3
LOAD MAX DEPTH*   4.6
LOAD SEDIMENT* SAND
DUMP NAME* TUFT POINT
DUMP LAT*  69.670000
DUMP LON* 132.650000
DUMP MIN DEPTH*   4.3
DUMP MAX DEPTH*   4.6
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* SAND
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  07/08/1977
  STOP DATE*  07/14/1977
  LOAD VOL*      129155
  DUMP VOL*      129155

  START DATE*  07/15/1977
  STOP DATE*  07/22/1977
  LOAD VOL*      116660
  DUMP VOL*      116660

  START DATE*  07/23/1977
  STOP DATE*  07/31/1977
  LOAD VOL*       64181
  DUMP VOL*       64181

  START DATE*  08/01/1977
  STOP DATE*  08/07/1977
  LOAD VOL*        7314
  DUMP VOL*        7314

  START DATE*  08/08/1977
  STOP DATE*  08/14/1977
  LOAD VOL*       91020
  DUMP VOL*       91020

  START DATE*  08/15/1977
  STOP DATE*  08/22/1977
  LOAD VOL*       58310
  DUMP VOL*       58310

  START DATE*  08/23/1977
  STOP DATE*  08/31/1977
  LOAD VOL*      62515
  DUMP VOL*      62515

  START DATE*  09/01/1977
  STOP DATE*  09/07/1977
  LOAD VOL*      20825
  DUMP VOL*      20825

  START DATE*  09/08/1977
  STOP DATE*  09/14/1977
  LOAD VOL*     -20825
  DUMP VOL*     -20825

  START DATE*  09/15/1977
  STOP DATE*  09/22/1977
  LOAD VOL*      53845
  DUMP VOL*      53845

  START DATE*  09/23/1977
  STOP DATE*  09/23/1977
  LOAD VOL*      17000
  DUMP VOL*      17000

  REFERENCE* DREDGING LICENSE APPLICATION FROM M. SHAW (ESSO) TO J. DUN
        LOP (DIAND) 07/04/83.

  REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF
       FISHERIES AND OCEANS,SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL
       ISLAND SUMMARY SUPPLEMENT.


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DATASET NUMBER* 77BMZ-01
YEAR* 1977
COMPANY & YEAR* IMPERIAL/ESSO 1977
DREDGE NAME* BEAVER MACKENZIE
DREDGE TYPE* STATIONARY SUCTION
PURPOSE* TUFT POINT BREAKWATER
LOAD NAME* TUFT POINT
LOAD LAT*  69.670000
LOAD LON* 132.650000
LOAD MIN DEPTH*   4.3
LOAD MAX DEPTH*   4.6
LOAD SEDIMENT* SAND
DUMP NAME* TUFT POINT
DUMP LAT*  69.670000
DUMP LON* 132.650000
DUMP MIN DEPTH*   8.0
DUMP MAX DEPTH*   8.0
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* SAND
ISLAND NAME* NOT APPLICABLE
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ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

START DATE* 07/10/1977
STOP DATE* 07/11/1977
LOAD VOL* 420000
DUMP VOL* 420000

REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

REFERENCE* IMPERIAL OIL LTD., 1977. REPORT ON THE 1976 ARCTIC OFFSHORE CONSTRUCTION PROGRAM. PRODUCTION DEPARTMENT, WESTERN REGION, OFFSHORE CONSTRUCTION GROUP. FIELD SERVICES; EDMONTON.

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DATASET NUMBER* 77BMZ-02
YEAR* 1977
COMPANY & YEAR* IMPERIAL/ESSO 1977
DREDGE NAME* BEAVER MACKENZIE
DREDGE TYPE* STATIONARY SUCTION
PURPOSE* ISSERK E-27 ISLAND
LOAD NAME* ISSERK E-27 AREA
LOAD LAT* 69.940000
LOAD LON* 134.370000
LOAD MIN DEPTH* 13.0
LOAD MAX DEPTH* 13.0
LOAD SEDIMENT* SAND
DUMP NAME* ISSERK E-27 ISLAND
DUMP LAT* 69.940000
DUMP LON* 134.370000
DUMP MIN DEPTH* 13.0
DUMP MAX DEPTH* 13.0
DUMP METHOD* SAND
DUMP SEDIMENT* SAND
ISLAND NAME* ISSERK E-27
ISLAND TYPE* SACRIFICIAL BEACH
ISLAND STATUS* ABANDONED JULY 1978

START DATE* 07/17/1977
STOP DATE* 07/31/1977
LOAD VOL* 357955
DUMP VOL* 238125

START DATE* 08/01/1977
STOP DATE* 08/31/1977
LOAD VOL* 739772
DUMP VOL* 492122

START DATE* 09/01/1977
STOP DATE* 09/30/1977
LOAD VOL* 715909

DUMP VOL* 476249

START DATE* 10/01/1977
STOP DATE* 10/12/1977
LOAD VOL* 286364
DUMP VOL* 190504

AUTHORITY REFERENCE* LAND USE PERMIT N76A341
AMOUNT LICENSED* 319586
TERM START* 09/01/1976
TERM COMPLETE* 09/01/1977

COMMENT* LOST VOLUME REPRESENTS TOTAL LOSS FROM BOTH TUFT POINT AND ISSERK E-27 AREA.

REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF FISHERIES AND OCEANS,SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL ISLAND SUMMARY SUPPLEMENT.

REFERENCE* IMPERIAL OIL LTD., 1977. PROJECT SUMMARY REPORT ISSERK E-27. PRODUCTION DEPARTMENT, FRONTIER OPERATIONS, OFFSHORE CONSTRUCTION GROUP. FIELD SERVICES; EDMONTON.

REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

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DATASET NUMBER* 77UNK-01
YEAR* 1977
COMPANY & YEAR* DOME/CANMAR 1977
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* INFORMATION NOT FOUND IN SEARCH
PURPOSE* TUK HARBOUR DOCK CONSTRUCTION AND FILL
LOAD NAME* UKALERK C-50
LOAD LAT* 70.150000
LOAD LON* 132.740000
LOAD MIN DEPTH* 27.7
LOAD MAX DEPTH* 27.7
LOAD SEDIMENT* SAND
DUMP NAME* TUK HARBOUR
DUMP LAT* INFORMATION NOT FOUND IN SEARCH
DUMP LON* INFORMATION NOT FOUND IN SEARCH
DUMP MIN DEPTH* INFORMATION NOT FOUND IN SEARCH
DUMP MAX DEPTH* INFORMATION NOT FOUND IN SEARCH
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

START DATE* 07/01/1977
STOP DATE* 01/01/1901
LOAD VOL* 18519

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 DUMP VOL*      18519

 COMMENT* THIS VOLUME IS APPROXIMATE.

 REFERENCE* ED PESSAH, DOME, PERSONAL COMMUNICATION, 1983.

 REFERENCE* LETTER FROM M. THOMAS (COGLA, YELLOWKNIFE) TO M. REED (DEP
      T. OF FISHERIES AND OCEANS, SIDNEY) 07/06/83.


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DATASET NUMBER* 77UNK-02
YEAR* 1977
COMPANY & YEAR* ARCNAV MARINE LTD. 1977
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* BARGE
PURPOSE* TUK HARBOUR DOCK CONSTRUCTION AND FILL
LOAD NAME* TUK HARBOUR
LOAD LAT*  69.450000
LOAD LON* 133.030000
LOAD MIN DEPTH*    4.3
LOAD MAX DEPTH*    4.3
LOAD SEDIMENT* SAND
DUMP NAME* TUK HARBOUR
DUMP LAT*  69.450000
DUMP LON* 133.030000
DUMP MIN DEPTH*    4.3
DUMP MAX DEPTH*    4.3
DUMP METHOD* BARGE
DUMP SEDIMENT* SAND
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  07/27/1977
  STOP DATE*  07/08/1977
  LOAD VOL*       7646
  DUMP VOL*       7646

  AUTHORITY REFERENCE* WATER LOT LEASE #2358
  AMOUNT LICENSED*          0
  TERM START*  01/01/1999
  TERM COMPLETE*  01/01/1999

  COMMENT* THIS DREDGING WAS UNPERMITTED.

  COMMENT* DREDGED SAND WAS PLACED ON LAND, MUD FILLED IN THE SAND HOLE
       S.

  REFERENCE* ENVIRONMENTAL PROTECTION SERVICE, YELLOWKNIFE. NOTES ON AN
        UNPERMITTED DREDGING OPERATION
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DATASET NUMBER* 77UNK-03
YEAR* 1977
COMPANY & YEAR* DOME/CANMAR 1977
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* INFORMATION NOT FOUND IN SEARCH
PURPOSE* KAGLULIK A-75 GLORY HOLE
LOAD NAME* KAGLULIK A-75
LOAD LAT*  70.570000
LOAD LON* 130.860000
LOAD MIN DEPTH*  27.0
LOAD MAX DEPTH*  27.0
LOAD SEDIMENT* GRAVEL, SAND, CLAY
DUMP NAME* NOT APPLICABLE
DUMP LAT*   NOT APPLICABLE
DUMP LON*   NOT APPLICABLE
DUMP MIN DEPTH*   NOT APPLICABLE
DUMP MAX DEPTH*   NOT APPLICABLE
DUMP METHOD* NOT APPLICABLE
DUMP SEDIMENT* NOT APPLICABLE
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  08/01/1977
  STOP DATE*  01/01/1901
  LOAD VOL*      18519
  DUMP VOL*      18519

  COMMENT* THIS VOLUME IS APPROXIMATE.

  REFERENCE* ED PESSAH, DOME, PERSONAL COMMUNICATION, 1983.

  REFERENCE* LETTER FROM M. THOMAS (COGLA, YELLOWKNIFE) TO M. REED (DEP
        T. OF FISHERIES AND OCEANS, SIDNEY) 07/06/83.


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DATASET NUMBER* 78BMZ-01
YEAR* 1978
COMPANY & YEAR* IMPERIAL/ESSO 1978
DREDGE NAME* BEAVER MACKENZIE
DREDGE TYPE* STATIONARY SUCTION
PURPOSE* TUFT POINT BREAKWATER
LOAD NAME* TUFT POINT
LOAD LAT*  69.670000
LOAD LON* 132.650000
LOAD MIN DEPTH*   4.3
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LOAD MAX DEPTH* 4.6
LOAD SEDIMENT* SAND
DUMP NAME* TUFT POINT
DUMP LAT* 69.670000
DUMP LON* 132.650000
DUMP MIN DEPTH* 4.3
DUMP MAX DEPTH* 4.6
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* SAND
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

START DATE* 01/01/1978
STOP DATE* 01/01/1900
LOAD VOL* 450000
DUMP VOL* 450000

REFERENCE* DREDGING LICENSE APPLICATION FROM M. SHAW (ESSO) TO J. DUNLOP (DIAND) 07/04/83.

REFERENCE* LETTER FROM E. BENNETT (ESSO) TO A. REDSHAW (DIAND) 04/14/83.

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DATASET NUMBER* 78UNK-01
YEAR* 1978
COMPANY & YEAR* DOME/CANMAR 1978
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* INFORMATION NOT FOUND IN SEARCH
PURPOSE* NATSEK E-56 GLORY HOLE
LOAD NAME* NATSEK E-56
LOAD LAT* 69.760000
LOAD LON* 139.740000
LOAD MIN DEPTH* 34.0
LOAD MAX DEPTH* 34.0
LOAD SEDIMENT* SILT, CLAY
DUMP NAME* NOT APPLICABLE
DUMP LAT* NOT APPLICABLE
DUMP LON* NOT APPLICABLE
DUMP MIN DEPTH* NOT APPLICABLE
DUMP MAX DEPTH* NOT APPLICABLE
DUMP METHOD* NOT APPLICABLE
DUMP SEDIMENT* NOT APPLICABLE
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

START DATE* 07/01/1978
STOP DATE* 01/01/1901
LOAD VOL* 18519

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  DUMP VOL*      18519

  COMMENT* THIS VOLUME IS APPROXIMATE.

  REFERENCE* LETTER FROM M. THOMAS (COGLA, YELLOWKNIFE) TO M. REED (DEP
        T. OF FISHERIES AND OCEANS, SIDNEY) 07/06/83.

  REFERENCE* ED PESSAH, DOME, PERSONAL COMMUNICATION, 1983.


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DATASET NUMBER* 78UNK-02
YEAR* 1978
COMPANY & YEAR* DOME/CANMAR 1978
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* INFORMATION NOT FOUND IN SEARCH
PURPOSE* UKALERK 2C-50 GLORY HOLE
LOAD NAME* UKALERK 2C-50
LOAD LAT*  70.150000
LOAD LON* 132.730000
LOAD MIN DEPTH*  30.0
LOAD MAX DEPTH*  30.0
LOAD SEDIMENT* SAND
DUMP NAME* NOT APPLICABLE
DUMP LAT*   NOT APPLICABLE
DUMP LON*   NOT APPLICABLE
DUMP MIN DEPTH*   NOT APPLICABLE
DUMP MAX DEPTH*   NOT APPLICABLE
DUMP METHOD* NOT APPLICABLE
DUMP SEDIMENT* NOT APPLICABLE
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  07/01/1978
  STOP DATE*  01/01/1901
  LOAD VOL*      18519
  DUMP VOL*      18519

  COMMENT* THIS VOLUME IS APPROXIMATE.

  REFERENCE* ED PESSAH, DOME, PERSONAL COMMUNICATION, 1983.

  REFERENCE* LETTER FROM M. THOMAS (COGLA, YELLOWKNIFE) TO M. REED (DEP
        T. OF FISHERIES AND OCEANS, SIDNEY) 07/06/83.


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DATASET NUMBER* 78UNK-03
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YEAR* 1978
COMPANY & YEAR* DOME/CANMAR 1978
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* INFORMATION NOT FOUND IN SEARCH
PURPOSE* KAGLULIK M-64 GLORY HOLE
LOAD NAME* KAGLULIK M-64
LOAD LAT*  70.570000
LOAD LON* 130.840000
LOAD MIN DEPTH*  27.0
LOAD MAX DEPTH*  27.0
LOAD SEDIMENT* SAND, SILT, CLAY
DUMP NAME* NOT APPLICABLE
DUMP LAT*   NOT APPLICABLE
DUMP LON*   NOT APPLICABLE
DUMP MIN DEPTH*   NOT APPLICABLE
DUMP MAX DEPTH*   NOT APPLICABLE
DUMP METHOD* NOT APPLICABLE
DUMP SEDIMENT* NOT APPLICABLE
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  11/01/1978
  STOP DATE*  01/01/1901
  LOAD VOL*      18519
  DUMP VOL*      18519

  COMMENT* THIS VOLUME IS APPROXIMATE.

  REFERENCE* ED PESSAH, DOME, PERSONAL COMMUNICATION, 1983.

  REFERENCE* LETTER FROM M. THOMAS (COGLA, YELLOWKNIFE) TO M. REED (DEP
        T. OF FISHERIES AND OCEANS, SIDNEY) 07/06/83.


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DATASET NUMBER* 79AQU-01
YEAR* 1979
COMPANY & YEAR* DOME/CANMAR 1979
DREDGE NAME* AQUARIUS
DREDGE TYPE* CUTTER SUCTION
PURPOSE* MCKINLEY BAY HARBOUR MAINTENANCE AND CHANNEL CONSTRUCTION
LOAD NAME* MCKINLEY BAY
LOAD LAT*  69.960000
LOAD LON* 131.170000
LOAD MIN DEPTH*   3.0
LOAD MAX DEPTH*    .0
LOAD SEDIMENT* SAND, SILT
DUMP NAME* MCKINLEY BAY
DUMP LAT*  69.960000
DUMP LON* 131.170000
DUMP MIN DEPTH*    .0
DUMP MAX DEPTH*   7.5
DUMP METHOD* FLOATING PIPELINE
DUMP SEDIMENT* SAND, SILT
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  09/06/1979
  STOP DATE*  09/07/1979
  LOAD VOL*      143112
  DUMP VOL*      143112

  START DATE*  09/08/1979
  STOP DATE*  09/14/1979
  LOAD VOL*      500888
  DUMP VOL*      500888

  START DATE*  09/15/1979
  STOP DATE*  09/22/1979
  LOAD VOL*      598000
  DUMP VOL*      598000

  START DATE*  09/23/1979
  STOP DATE*  09/30/1979
  LOAD VOL*      683000
  DUMP VOL*      683000

  START DATE*  10/01/1979
  STOP DATE*  10/07/1979
  LOAD VOL*      593000
  DUMP VOL*      593000

  START DATE*  10/08/1979
  STOP DATE*  10/14/1979
  LOAD VOL*      687000
  DUMP VOL*      687000

  START DATE*  10/16/1979
  STOP DATE*  10/22/1979
  LOAD VOL*      222000
  DUMP VOL*      222000

  AUTHORITY REFERENCE* ODCA PERMIT 4443-0813
  AMOUNT LICENSED*    6500000
  TERM START*  09/06/1979
  TERM COMPLETE*  10/19/1979

  COMMENT* MONITORING STUDIES CARRIED OUT BY ARCTIC LABS BEGINNING 07/1
        3/79 FOR GEOCHEMICAL PARAMETRES, 09/25/79 FOR PHYSICAL OCEANOGR
        APHIC PARAMETRES.

  COMMENT* VIOLATION OF PERMIT NOTED IN 10/14/79 INSPECTION REPORT; DIS
        CHARGE OF DREDGED MATERIAL IN OTHER THAN DESIGNATED AREA.

  COMMENT* KNOWN INSPECTION DATES: 09/09/79, 14/09/79, 17/09/79, 27/09/
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79, 14/10/79, 18/130/79.

REFERENCE* GAZETTED PERMIT 0813.

REFERENCE* THOMAS, D.J. 1979 DOME PETROLEUM MCKINLEY BAY DREDGING PROGRAM PHASE 1; GEOCHEMICAL BASELINE SURVEY AND ENVIRONMENTAL MONITORING DURING 1979 OPERATIONS. PREPARED FOR DOME PETROLEUM LTD., CALGARY (UNPUBLISHED MANUSCRIPT).

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DATASET NUMBER* 79ARN-01
YEAR* 1979
COMPANY & YEAR* GOVT NWT 1979
DREDGE NAME* ARCTIC NORTHERN
DREDGE TYPE* CUTTER SUCTION
PURPOSE* TUK LANDFILL FOR SUBDIVISION
LOAD NAME* TUK HARBOUR, SOUTH OF CONN ISLAND
LOAD LAT* 69.450000
LOAD LON* 133.030000
LOAD MIN DEPTH* .6
LOAD MAX DEPTH* 5.5
LOAD SEDIMENT* GRAVEL, SAND
DUMP NAME* TUKTOYAKTUK (LAND), SOUTH OF POKIAK LAKE
DUMP LAT* 69.440000
DUMP LON* 133.040000
DUMP MIN DEPTH* NOT APPLICABLE
DUMP MAX DEPTH* NOT APPLICABLE
DUMP METHOD* FLOATING PIPELINE
DUMP SEDIMENT* GRAVEL, SAND
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

START DATE* 09/24/1979
STOP DATE* 09/30/1979
LOAD VOL* 60000
DUMP VOL* 60000

START DATE* 10/01/1979
STOP DATE* 10/02/1979
LOAD VOL* 20000
DUMP VOL* 20000

REFERENCE* HAIST, G., AND B. MILBURN, (GNWT) 1980. DREDGING REDUCES COSTS OF DEVELOPED RESIDENTIAL LAND IN NORTHERN CANADA. PRESENTED AT THE NINTH WORLD DREDGING CONFERENCE, VANCOUVER, 1980.

REFERENCE* THURBER CONSULTANTS LTD., 1979. CONSTRUCTION OBSERVATIONS DREDGED LANDFILL - TUKTOYAKTUK. PREPARED FOR DEPARTMENT OF PUBLIC WORKS, GOVT GNWT.

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DATASET NUMBER* 79BMZ-01
YEAR* 1979
COMPANY & YEAR* IMPERIAL/ESSO 1979
DREDGE NAME* BEAVER MACKENZIE
DREDGE TYPE* STATIONARY SUCTION
PURPOSE* ISSUNGNAK O-61 ISLAND
LOAD NAME* TUFT POINT
LOAD LAT*  69.670000
LOAD LON* 132.650000
LOAD MIN DEPTH*   4.3
LOAD MAX DEPTH*   4.6
LOAD SEDIMENT* SAND
DUMP NAME* ISSUNGNAK O-61 ISLAND
DUMP LAT*  70.000000
DUMP LON* 134.310000
DUMP MIN DEPTH*  19.0
DUMP MAX DEPTH*  20.0
DUMP METHOD* PIPELINE DISCHARGE
DUMP SEDIMENT* SAND
ISLAND NAME* ISSUNGNAK O-61
ISLAND TYPE* SACRIFICIAL BEACH
ISLAND STATUS* ABANDONED 1981

  START DATE*  07/09/1979
  STOP DATE*  07/31/1979
  LOAD VOL*      939880
  DUMP VOL*      805000

  START DATE*  08/01/1979
  STOP DATE*  08/31/1979
  LOAD VOL*     1266800
  DUMP VOL*     1085000

  START DATE*  09/01/1979
  STOP DATE*  09/30/1979
  LOAD VOL*     1225930
  DUMP VOL*     1050000

  START DATE*  10/01/1979
  STOP DATE*  10/22/1979
  LOAD VOL*      899010
  DUMP VOL*      770000

  COMMENT* BEAVER MACKENZIE WAS ASSISTED BY THE SCEPTRE MACKENZIE DURING
          THIS OPERATION.

  AUTHORITY REFERENCE* LAND USE PERMIT N78A849
  AMOUNT LICENSED*     4900000
  TERM START*  INFORMATION NOT FOUND IN SEARCH
  TERM COMPLETE*  INFORMATION NOT FOUND IN SEARCH
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REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF FISHERIES AND OCEANS,SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL ISLAND SUMMARY SUPPLEMENT.

REFERENCE* SWAN WOOSTER ENGINEERING CO. LTD., 1982. ENVIRONMENTAL IMPACT STATEMENT; STUDY OF PRODUCTION STRUCTURES, BEAUFORT SEA OIL FIELD DEVELOPEMENT. PREPARED FOR DOME PETROLEUM LTD., ESSO RESOURCES CANADA LTD., GULF CANADA RESOURCES INC., AUGUST 1982.

REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

REFERENCE* SWAN WOOSTER ENGINEERING CO. LTD., 1982. ENVIRONMENTAL IMPACT STATEMENT; STUDY OF PRODUCTION STRUCTURES, BEAUFORT SEA OIL FIELD DEVELOPEMENT. PREPARED FOR DOME PETROLEUM LTD., ESSO RESOURCES CANADA LTD., GULF CANADA RESOURCES INC., AUGUST 1982.

REFERENCE* IMPERIAL OIL LTD. 1977. REPORT ON THE 1976 ARCTIC OFFSHORE CONSTRUCTION PROGRAM. PRODUCTION DEPT., WESTERN REGION, OFFSHORE CONSTRUCTION GROUP. FIELD SERVICES, EDMONTON.

REFERENCE* ESSO RESOURCES CANADA LTD. 1979. ISSUNGNAK O-61 1978 AND 1979 DAILY REPORTS. ESSO RESOURCES CANADA LTD., CALGARY.

REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF FISHERIES AND OCEANS,SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL ISLAND SUMMARY.

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DATASET NUMBER* 79BMZ-02
YEAR* 1979
COMPANY & YEAR* IMPERIAL/ESSO 1979
DREDGE NAME* BEAVER MACKENZIE
DREDGE TYPE* STATIONARY SUCTION
PURPOSE* TUFT POINT BREAKWATER
LOAD NAME* TUFT POINT
LOAD LAT* 69.670000
LOAD LON* 132.650000
LOAD MIN DEPTH* 4.3
LOAD MAX DEPTH* 4.6
LOAD SEDIMENT* SAND
DUMP NAME* TUFT POINT
DUMP LAT* 69.670000
DUMP LON* 132.650000
DUMP MIN DEPTH* 4.3
DUMP MAX DEPTH* 4.6
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* SAND
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

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  START DATE*  01/01/1979
  STOP DATE*  01/01/1900
  LOAD VOL*     450000
  DUMP VOL*     450000

  REFERENCE* DREDGING LICENSE APPLICATION FROM M. SHAW (ESSO) TO J. DUN
       LOP (DIAND) 07/04/83.

  REFERENCE* LETTER FROM E. BENNETT (ESSO) TO A. REDSHAW (DIAND) 04/14/
       83.


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DATASET NUMBER* 79UNK-01
YEAR* 1979
COMPANY & YEAR* DOME/CANMAR 1979
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* INFORMATION NOT FOUND IN SEARCH
PURPOSE* KOAKOAK O-22 GLORY HOLE
LOAD NAME* KOAKOAK O-22
LOAD LAT*  70.370000
LOAD LON* 134.100000
LOAD MIN DEPTH*  44.0
LOAD MAX DEPTH*  44.0
LOAD SEDIMENT* SAND, SILT
DUMP NAME* NOT APPLICABLE
DUMP LAT*   NOT APPLICABLE
DUMP LON*   NOT APPLICABLE
DUMP MIN DEPTH*   NOT APPLICABLE
DUMP MAX DEPTH*   NOT APPLICABLE
DUMP METHOD* NOT APPLICABLE
DUMP SEDIMENT* NOT APPLICABLE
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  01/01/1979
  STOP DATE*  01/01/1900
  LOAD VOL*      18519
  DUMP VOL*      18519

  COMMENT* THIS VOLUME IS APPROXIMATE.

  REFERENCE* ED PESSAH, DOME, PERSONAL COMMUNICATION, 1983.

  REFERENCE* LETTER FROM M. THOMAS (COGLA, YELLOWKNIFE) TO M. REED (DEP
       T. OF FISHERIES AND OCEANS, SIDNEY) 07/06/83.


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DATASET NUMBER* 80AQU-01
YEAR* 1980
COMPANY & YEAR* DOME/CANMAR 1980
DREDGE NAME* AQUARIUS
DREDGE TYPE* CUTTER SUCTION
PURPOSE* MCKINLEY BAY HARBOUR MAINTENANCE, MOORING BASIN, ACCESS CHANNE
     L
LOAD NAME* MCKINLEY BAY
LOAD LAT*  69.940000
LOAD LON* 131.220000
LOAD MIN DEPTH*   3.0
LOAD MAX DEPTH*  15.0
LOAD SEDIMENT* SAND, CLAY
DUMP NAME* MCKINLEY BAY, 500-600 M EAST OF DESIGNATED LOAD SITE
DUMP LAT*  69.940000
DUMP LON* 131.200000
DUMP MIN DEPTH*   3.0
DUMP MAX DEPTH*  12.0
DUMP METHOD* PIPELINE DISCHARGE
DUMP SEDIMENT* SAND, CLAY
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  07/04/1980
  STOP DATE*  07/07/1980
  LOAD VOL*      314980
  DUMP VOL*      314980

  START DATE*  07/08/1980
  STOP DATE*  07/14/1980
  LOAD VOL*      774233
  DUMP VOL*      774233

  START DATE*  07/15/1980
  STOP DATE*  07/22/1980
  LOAD VOL*      560260
  DUMP VOL*      560260

  START DATE*  07/23/1980
  STOP DATE*  07/31/1980
  LOAD VOL*      681680
  DUMP VOL*      681680

  START DATE*  08/01/1980
  STOP DATE*  08/07/1980
  LOAD VOL*      607909
  DUMP VOL*      607909

  START DATE*  08/08/1980
  STOP DATE*  08/14/1980
  LOAD VOL*      571500
  DUMP VOL*      571500
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START DATE*  08/15/1980
STOP DATE*  08/22/1980
LOAD VOL*     559910
DUMP VOL*     559910

START DATE*  08/23/1980
STOP DATE*  08/31/1980
LOAD VOL*     589694
DUMP VOL*     589694

START DATE*  09/01/1980
STOP DATE*  09/07/1980
LOAD VOL*     319502
DUMP VOL*     319502

START DATE*  09/08/1980
STOP DATE*  09/14/1980
LOAD VOL*     353395
DUMP VOL*     353395

START DATE*  09/15/1980
STOP DATE*  09/22/1980
LOAD VOL*     262545
DUMP VOL*     262545

START DATE*  09/23/1980
STOP DATE*  09/30/1980
LOAD VOL*     264407
DUMP VOL*     264407

AUTHORITY REFERENCE* ODCA PERMIT 4443-0989
AMOUNT LICENSED*    4500000
TERM START*  06/24/1980
TERM COMPLETE*  10/30/1980

COMMENT* MONITORING REQUIREMENTS CARRIED OUT BY ARCTIC LABS LTD. BEGI
      NNING 07/04/1980 FOR PHYSICAL AND CHEMICAL PARAMETERS, AND BY
      DOME/CANMAR BEGINNING 07/20/1980 FOR BIOLOGICAL PARAMETERS.

COMMENT* KNOWN INSPECTION DATES; 06/25/80, 07/11/80, 07/23/80, 08/13/
      80, 09/05/80, 09/18/80.

REFERENCE* GAZETTED PERMIT 0989.

REFERENCE* WARD, J.G., 1981. WILDLIFE OBSERVATIONS DURING DREDGING OP
      ERATIONS IN MCKINLEY BAY, JULY-AUGUST 1980. DOME PETROLEUM LTD.
      , CALGARY.

REFERENCE* THOMAS, D.J., 1980. MCKINLEY BAY DREDGING PROJECT WATER QU
      ALITY MEASUREMENTES AND DREDGE SPOIL MONITORING. PREPARED BY AR
      CTIC LABORATORIES LTD. INUVIK, N.W.T. FOR DOME PETROLEUM LTD.,
      CALGARY.

REFERENCE* LETTER FROM W. BRYANT (EPS YELLOWKNIFE) TO R. HOOS (DOME)
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07/30/80.

REFERENCE* DOME INTERNAL CORRESPONDENCE FROM G. GEVAERT (BEAUFORT SEA CONSTRUCTION) TO J.U. VAN DER WAL 10/15/80.

REFERENCE* INSPECTION REPORT D.C. TILDEN, EPS YELLOWKNIFE, 06/25/80.

REFERENCE* INSPECTION REPORT J. NIXON, EPS YELLOWKNIFE, 07/11/80.

REFERENCE* INSPECTION REPORT D.C. TILDEN, EPS YELLOWKNIFE, 07/23/80.

REFERENCE* INSPECTION REPORT J. NIXON, EPS YELLOWKNIFE, 08/13/80.

REFERENCE* INSPECTION REPORT J. NIXON, EPS YELLOWKNIFE, 09/05/80.

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DATASET NUMBER* 80AQU-02
YEAR* 1980
COMPANY & YEAR* DOME/CANMAR 1980
DREDGE NAME* AQUARIUS
DREDGE TYPE* CUTTER SUCTION
PURPOSE* TUK HARBOUR AND CHANNEL MAINTENANCE
LOAD NAME* KUGMALLIT BAY
LOAD LAT* 69.450000
LOAD LON* 133.000000
LOAD MIN DEPTH* 1.5
LOAD MAX DEPTH* 11.0
LOAD SEDIMENT* GRAVEL, SAND, SILT, CLAY
DUMP NAME* KUGMALLIT BAY
DUMP LAT* 69.470000
DUMP LON* 132.980000
DUMP MIN DEPTH* 4.0
DUMP MAX DEPTH* 19.0
DUMP METHOD* PIPELINE DISCHARGE
DUMP SEDIMENT* GRAVEL, SAND, SILT, CLAY
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

START DATE* 10/08/1980
STOP DATE* 10/14/1980
LOAD VOL* 42590
DUMP VOL* 42590

START DATE* 10/15/1980
STOP DATE* 10/22/1980
LOAD VOL* 115842
DUMP VOL* 115842

START DATE* 10/23/1980
STOP DATE* 10/31/1980

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    LOAD VOL*      137957
    DUMP VOL*      137957

    START DATE*  11/01/1980
    STOP DATE*  11/07/1980
    LOAD VOL*       66989
    DUMP VOL*       66989

    AUTHORITY REFERENCE* ODCA PERMIT 4443-0990
    AMOUNT LICENSED*    4500000
    TERM START*  07/01/1980
    TERM COMPLETE*  11/30/1980

    COMMENT* LOAD SITE LAT AND LON ARE FOR SITE ORIGIN ONLY, FURTHER DETA
          ILS IN ODCA 0990.

    COMMENT* SECOND DUMP SITE 500M EAST OF DREDGED CHANNEL, FURTHER DETAI
          LS IN ODCA 0990.

    COMMENT* KNOWN INSPECTION DATES: 06/26/80, 07/23/80, 08/12/80, 09/05/
          80, 09/19/80.

    COMMENT* MONITORING REQUIREMENTS CARRIED OUT BY ARCTIC LABS BEGINNING
           JULY 1980 FOR PHYSICAL, CHEMICAL AND BIOLOGICAL PARAMETERS.

    REFERENCE* GAZETTED PERMIT 0990.

    REFERENCE* PESSAH, E., 1982. DREDGING ACTIVITIES OF DOME PETROLEUM IN
           THE ARCTIC AND ITS ENVIRONMENTAL IMPACT. IN PROCEEDINGS CANADI
          AN SOCIETY FOR CIVIL ENGINEERING, ANNUAL CONFERENCE, EDMONTON A
          LTA., MAY 1982.

    REFERENCE* EPEC CONSULTING WESTERN LTD., 1982. TUK HARBOUR RESERVOIR,
           DREDGING CONSTRUCTION OBSERVATIONS. EPEC CONSULTING WESTERN LT
          D., WHITEHORSE.

    REFERENCE* APD CONSULTING ENGINEERS, 1979. ENGINEERING REPORT FOR DRE
          DGING WORKS, TUKTOYAKTUK HARBOUR AND MCKINLEY BAY, BEAUFORT SEA
          . DON MILLS, ONTARIO.

    REFERENCE* DOME INTERNAL CORRESPONDENCE FROM G. GEVAERT (BEAUFORT SEA
           CONSTRUCTION) TO J.U. VAN DER WAL 10/15/80.


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  DATASET NUMBER* 80BMZ-01
  YEAR* 1980
  COMPANY & YEAR* IMPERIAL/ESSO 1980
  DREDGE NAME* BEAVER MACKENZIE
  DREDGE TYPE* STATIONARY SUCTION
  PURPOSE* ISSUNGNAK 2-0-61
  LOAD NAME* ISSUNGNAK 0-61 AREA
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LOAD LAT*  70.020000
LOAD LON*  70.000000
LOAD MIN DEPTH*  19.0
LOAD MAX DEPTH*  20.0
LOAD SEDIMENT* SAND, SILT
DUMP NAME* ISSUNGNAK 0-61 ISLAND
DUMP LAT*  70.000000
DUMP LON* 134.310000
DUMP MIN DEPTH*  19.0
DUMP MAX DEPTH*  20.0
DUMP METHOD* PIPELINE DISCHARGE
DUMP SEDIMENT* SAND, SILT
ISLAND NAME* ISSUNGNAK 0-61
ISLAND TYPE* SACRIFICIAL BEACH
ISLAND STATUS* ABANDONED 1981

  START DATE*  08/23/1980
  STOP DATE*  08/31/1980
  LOAD VOL*     367780
  DUMP VOL*     315000

  START DATE*  09/01/1980
  STOP DATE*  09/24/1980
  LOAD VOL*    1021600
  DUMP VOL*     875000

  AUTHORITY REFERENCE* LAND USE PERMIT N78A849
  AMOUNT LICENSED*    4900000
  TERM START*  06/05/1978
  TERM COMPLETE*  07/13/1983

  COMMENT* VOLUMES ARE APPROXIMATE.

  COMMENT* BEAVER MACKENZIE WAS ASSISTED BY SCEPTRE MACKENZIE DURING TH
        IS OPERATION.

  REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

  REFERENCE* WOODWARD-CLYDE CONSULTANTS, 1982. BEAUFORT SEA SEDIMENT DY
        NAMICS. PREPARED FOR GEOLOGICAL SURVEY OF CANADA, BEDFORD INSTI
        TUTE OF OCEANOGRAPHY, DARTMOUTH, N.S..WOODWARD-CLYDE CONSULTANT
        S, VICTORIA.

  REFERENCE* SWAN WOOSTER ENGINEERING CO. LTD., 1982. ENVIRONMENTAL IMP
        ACT STATEMENT; STUDY OF PRODUCTION STRUCTURES, BEAUFORT SEA OIL
        FIELD DEVELOPEMENT. PREPARED FOR DOME PETROLEUM LTD., ESSO RESO
        URCES CANADA LTD., GULF CANADA RESOURCES INC., AUGUST 1982.

  REFERENCE* ESSO RESOURCES CANADA LTD. 1979. ISSUNGNAK 0-61 1978 AND 1
        979 DAILY REPORTS. ESSO RESOURCES CANADA LTD., CALGARY.

  REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF
      FISHERIES AND OCEANS,SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL
      ISLAND SUMMARY.
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DATASET NUMBER* 80GEX-01
YEAR* 1980
COMPANY & YEAR* DOME/CANMAR 1980
DREDGE NAME* GEOPOTES X
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* KAGLULIK M-64 ISLAND (CANCELLED)
LOAD NAME* KAGLULIK SOUTH 50
LOAD LAT*  70.110000
LOAD LON* 131.750000
LOAD MIN DEPTH*  20.0
LOAD MAX DEPTH*  25.0
LOAD SEDIMENT* SAND
DUMP NAME* KAGLULIK M-64 ISLAND
DUMP LAT*  70.570000
DUMP LON* 130.840000
DUMP MIN DEPTH*  27.0
DUMP MAX DEPTH*  27.0
DUMP METHOD* SUCTION PIPELINE
DUMP SEDIMENT* SAND
ISLAND NAME* KAGLULIK M-64
ISLAND TYPE* CRI BERM
ISLAND STATUS* OPERATION CANCELLED

  START DATE*  09/17/1980
  STOP DATE*  09/20/1980
  LOAD VOL*       43480
  DUMP VOL*       43480

  START DATE*  09/23/1980
  STOP DATE*  09/27/1980
  LOAD VOL*       58875
  DUMP VOL*       58875

  START DATE*  10/01/1980
  STOP DATE*  10/01/1980
  LOAD VOL*       14550
  DUMP VOL*       14550

  START DATE*  10/09/1980
  STOP DATE*  10/10/1980
  LOAD VOL*       21400
  DUMP VOL*       21400

  AUTHORITY REFERENCE* PLGA LIC 3523, LEASE 3522
  AMOUNT LICENSED*    1360000
  TERM START*  09/10/1980
  TERM COMPLETE*  09/01/1983

  REFERENCE* LETTER FROM R. HOOS (DOME) TO D. STONE (DIAND), 10/17/80.
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REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.


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DATASET NUMBER* 80GEX-02
YEAR* 1980
COMPANY & YEAR* DOME/CANMAR 1980
DREDGE NAME* GEOPOTES X
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* KAGLULIK M-64 ISLAND (CANCELLED)
LOAD NAME* WEST 17 BORROW
LOAD LAT*   PROPRIETARY
LOAD LON*   PROPRIETARY
LOAD MIN DEPTH*  16.0
LOAD MAX DEPTH*  18.0
LOAD SEDIMENT* SAND
DUMP NAME* KAGLULIK M-64 ISLAND
DUMP LAT*  70.570000
DUMP LON* 130.840000
DUMP MIN DEPTH*  27.0
DUMP MAX DEPTH*  27.0
DUMP METHOD* BOTTOM VALVE
DUMP SEDIMENT* SAND
ISLAND NAME* KAGLULIK M-64
ISLAND TYPE* CRI BERM
ISLAND STATUS* OPERATION CANCELLED

  START DATE*  09/21/1980
  STOP DATE*  09/22/1980
  LOAD VOL*      45060
  DUMP VOL*      45060

  START DATE*  09/28/1980
  STOP DATE*  09/30/1980
  LOAD VOL*      70850
  DUMP VOL*      70850

  START DATE*  10/02/1980
  STOP DATE*  10/04/1980
  LOAD VOL*      29980
  DUMP VOL*      29980

  AUTHORITY REFERENCE* PLGA LIC 3523, LEASE 3522
  AMOUNT LICENSED*    1360000
  TERM START*  09/10/1980
  TERM COMPLETE*  09/01/1983

  REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

  REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.
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DATASET NUMBER* 80GEX-03
YEAR* 1980
COMPANY & YEAR* DOME/CANMAR 1980
DREDGE NAME* GEOPOTES X
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* TARSIUT CLAY REMOVAL
LOAD NAME* TARSIUT N-44
LOAD LAT*  69.900000
LOAD LON* 136.190000
LOAD MIN DEPTH*  23.0
LOAD MAX DEPTH*  23.0
LOAD SEDIMENT* CLAY
DUMP NAME* TARSIUT N-44 ISLAND
DUMP LAT*  69.900000
DUMP LON* 136.190000
DUMP MIN DEPTH*  23.0
DUMP MAX DEPTH*  23.0
DUMP METHOD* BOTTOM VALVE
DUMP SEDIMENT* CLAY
ISLAND NAME* TARSIUT N-44
ISLAND TYPE* CRI BERM
ISLAND STATUS* DRILLING COMPLETE 1983

  START DATE*  10/05/1980
  STOP DATE*  10/08/1980
  LOAD VOL*      84900
  DUMP VOL*      84900

  REFERENCE* DOME PETROLEUM LTD., 1980. OFFSHORE ISLAND DAILY REPORT, 1
       0/08/80.

  REFERENCE* DOME PETROLEUM LTD., 1980. ISLAND DREDGING REPORT, 1981 SE
       ASON. NOV 6, 1981.

  REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.


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DATASET NUMBER* 80GEX-04
YEAR* 1980
COMPANY & YEAR* DOME/CANMAR 1980
DREDGE NAME* GEOPOTES X
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* TARSIUT N-44 ISLAND
LOAD NAME* ISSERK AREA
LOAD LAT*  69.650000
LOAD LON* 134.200000
LOAD MIN DEPTH*  16.0
LOAD MAX DEPTH*  18.0
LOAD SEDIMENT* SAND
DUMP NAME* TARSIUT N-44 ISLAND
DUMP LAT*  69.900000
DUMP LON* 136.190000
DUMP MIN DEPTH*  23.0
DUMP MAX DEPTH*  23.0
DUMP METHOD* BOTTOM VALVE AND PUMP OUT
DUMP SEDIMENT* SAND
ISLAND NAME* TARSIUT N-44
ISLAND TYPE* CRI BERM
ISLAND STATUS* DRILLING COMPLETE 1983

  START DATE*  10/11/1980
  STOP DATE*  10/13/1980
  LOAD VOL*       26690
  DUMP VOL*       26690

  START DATE*  10/17/1980
  STOP DATE*  10/18/1980
  LOAD VOL*       20030
  DUMP VOL*       20030

  AUTHORITY REFERENCE* PLGA LIC 3527
  AMOUNT LICENSED*      INFORMATION NOT FOUND IN SEARCH
  TERM START*  09/12/1980
  TERM COMPLETE*  09/01/1983

  REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.


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DATASET NUMBER* 80GEX-05
YEAR* 1980
COMPANY & YEAR* DOME/CANMAR 1980
DREDGE NAME* GEOPOTES X
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* TARSIUT N-44 ISLAND
LOAD NAME* UKALERK
LOAD LAT*  69.830000
LOAD LON* 133.000000
LOAD MIN DEPTH*  16.0
LOAD MAX DEPTH*  18.0
LOAD SEDIMENT* SAND
DUMP NAME* TARSIUT N-44 ISLAND
DUMP LAT*  69.900000
DUMP LON* 136.190000
DUMP MIN DEPTH*  23.0
DUMP MAX DEPTH*  23.0
DUMP METHOD* BOTTOM VALVE AND PUMP OUT
DUMP SEDIMENT* SAND
ISLAND NAME* TARSIUT N-44
ISLAND TYPE* CRI BERM
ISLAND STATUS* DRILLING COMPLETE 1983

  START DATE*  10/15/1980
  STOP DATE*  10/16/1980
  LOAD VOL*       13980
  DUMP VOL*       13980

  START DATE*  10/22/1980
  STOP DATE*  10/22/1980
  LOAD VOL*        7870
  DUMP VOL*        7870

  START DATE*  10/23/1980
  STOP DATE*  10/31/1980
  LOAD VOL*      112020
  DUMP VOL*      112020

  AUTHORITY REFERENCE* PLGA LIC 3527
  AMOUNT LICENSED*     INFORMATION NOT FOUND IN SEARCH
  TERM START*  09/12/1980
  TERM COMPLETE*  09/01/1983

  REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.


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DATASET NUMBER* 80SCM-01
YEAR* 1980
COMPANY & YEAR* IMPERIAL/ESSO 1980
DREDGE NAME* SCEPTRE MACKENZIE
DREDGE TYPE* STATIONARY SUCTION
PURPOSE* ISSUNGNAK 2-0-61
LOAD NAME* ISSUNGNAK 0-61 AREA
LOAD LAT*  70.020000
LOAD LON* 134.310000
LOAD MIN DEPTH*  19.0
LOAD MAX DEPTH*  20.0
LOAD SEDIMENT* SAND
DUMP NAME* ISSUNGNAK 0-61 ISLAND
DUMP LAT*  70.020000
DUMP LON* 134.310000
DUMP MIN DEPTH*  19.0
DUMP MAX DEPTH*  20.0
DUMP METHOD* PIPELINE DISCHARGE
DUMP SEDIMENT* SAND, SILT
ISLAND NAME* ISSUNGNAK 0-61
ISLAND TYPE* SACRIFICIAL BEACH
ISLAND STATUS* ABANDONED 1981

  START DATE*  08/23/1980
  STOP DATE*  09/25/1980
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LOAD VOL* INFORMATION NOT FOUND IN SEARCH
DUMP VOL* INFORMATION NOT FOUND IN SEARCH

AUTHORITY REFERENCE* LAND USE PERMIT N78A849
AMOUNT LICENSED* 4900000
TERM START* 06/05/1978
TERM COMPLETE* 07/13/1983

COMMENT* SCEPTRE MACKENZIE ASSISTED THE BEAVER MACKENZIE DURING THIS OPERATION.COMBINED VOLUMES FOUND IN 80BMZ-01.

REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

REFERENCE* SWAN WOOSTER ENGINEERING CO. LTD., 1982. ENVIRONMENTAL IMPACT STATEMENT; STUDY OF PRODUCTION STRUCTURES, BEAUFORT SEA OIL FIELD DEVELOPEMENT. PREPARED FOR DOME PETROLEUM LTD., ESSO RESOURCES CANADA LTD., GULF CANADA RESOURCES INC., AUGUST 1982.

REFERENCE* IMPERIAL OIL LTD. 1977. REPORT ON THE 1976 ARCTIC OFFSHORE CONSTRUCTION PROGRAM. PRODUCTION DEPT., WESTERN REGION, OFFSHORE CONSTRUCTION GROUP. FIELD SERVICES, EDMONTON.

REFERENCE* ESSO RESOURCES CANADA LTD. 1979. ISSUNGNAK O-61 1978 AND 1979 DAILY REPORTS. ESSO RESOURCES CANADA LTD., CALGARY.

REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF FISHERIES AND OCEANS,SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL ISLAND SUMMARY.

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DATASET NUMBER* 80UNK-01
YEAR* 1980
COMPANY & YEAR* DOME/CANMAR 1980
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* INFORMATION NOT FOUND IN SEARCH
PURPOSE* KILANNAK A-77 GLORY HOLE
LOAD NAME* KILANNAK A-77
LOAD LAT* 70.770000
LOAD LON* 129.350000
LOAD MIN DEPTH* 25.0
LOAD MAX DEPTH* 25.0
LOAD SEDIMENT* INFORMATION NOT FOUND IN SEARCH
DUMP NAME* NOT APPLICABLE
DUMP LAT* NOT APPLICABLE
DUMP LON* NOT APPLICABLE
DUMP MIN DEPTH* NOT APPLICABLE
DUMP MAX DEPTH* NOT APPLICABLE
DUMP METHOD* NOT APPLICABLE
DUMP SEDIMENT* NOT APPLICABLE
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE

ISLAND STATUS* NOT APPLICABLE

START DATE* 01/01/1980
STOP DATE* 01/01/1900
LOAD VOL* 18519
DUMP VOL* 18519

COMMENT* THIS VOLUME IS APPROXIMATE.

REFERENCE* ED PESSAH, DOME, PERSONAL COMMUNICATION, 1983.

REFERENCE* LETTER FROM M. THOMAS (COGLA, YELLOWKNIFE) TO M. REED (DEPT. OF FISHERIES AND OCEANS, SIDNEY) 07/06/83.

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DATASET NUMBER* 81AQU-01
YEAR* 1981
COMPANY & YEAR* DOME/CANMAR 1981
DREDGE NAME* AQUARIUS
DREDGE TYPE* CUTTER SUCTION
PURPOSE* TUK HARBOUR DOCK CONSTRUCTION AND FILL
LOAD NAME* TUK HARBOUR
LOAD LAT* 69.430000
LOAD LON* 132.980000
LOAD MIN DEPTH* 3.0
LOAD MAX DEPTH* 3.0
LOAD SEDIMENT* SAND, SILT
DUMP NAME* TUK HARBOUR
DUMP LAT* 69.430000
DUMP LON* 132.980000
DUMP MIN DEPTH* 10.0
DUMP MAX DEPTH* 18.5
DUMP METHOD* FLOATING PIPELINE
DUMP SEDIMENT* SAND, SILT
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

START DATE* 06/16/1981
STOP DATE* 06/18/1981
LOAD VOL* 35807
DUMP VOL* 35807

AUTHORITY REFERENCE* ODCA PERMIT 4443-1208
AMOUNT LICENSED* 10000
TERM START* 06/08/1981
TERM COMPLETE* 11/30/1981

COMMENT* MONITORING STUDIES CARRIED OUT BY ARCTIC LABS. LTD. BEGINING 07/13/79 FOR GEOCHEMICAL PARAMETERS.

REFERENCE* GAZETTED PERMIT 1208.

REFERENCE* DOME PETROLEUM LTD., 1981. AQUARIUS 1981 DREDGING REPORT. BEAUFORT SEA CONSTRUCTION (DOME); CALGARY.

REFERENCE* LETTER FROM B. WILSON (EPS, YELLOWKNIFE) TO R. HOOS (DOME) , 07/13/81.

REFERENCE* LETTER FROM R. HOOS (DOME) TO W. BRYANT (EPS, YELLOWKNIFE) , 06/26/81.

REFERENCE* LETTER FROM R. HOOS (DOME) TO B. WILSON (EPS, YELLOWKNIFE) , 08/11/81.

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DATASET NUMBER* 81AQU-02
YEAR* 1981
COMPANY & YEAR* GOVT NWT AND DOME/CANMAR 1981
DREDGE NAME* AQUARIUS
DREDGE TYPE* CUTTER SUCTION
PURPOSE* TUK RESERVOIR
LOAD NAME* TUK HARBOUR
LOAD LAT* 69.440000
LOAD LON* 133.000000
LOAD MIN DEPTH* 2.4
LOAD MAX DEPTH* 5.8
LOAD SEDIMENT* SAND, SILT, CLAY
DUMP NAME* TUKTOYAKTUK (LAND), EAST OF TAREOKNITOK LAGOON
DUMP LAT* 69.440000
DUMP LON* 133.010000
DUMP MIN DEPTH* NOT APPLICABLE
DUMP MAX DEPTH* NOT APPLICABLE
DUMP METHOD* FLOATING PIPELINE, SUBMERGED PIPELINE
DUMP SEDIMENT* SAND, SILT, CLAY
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

START DATE* 06/18/1981
STOP DATE* 06/22/1981
LOAD VOL* 41000
DUMP VOL* 41000

START DATE* 06/23/1981
STOP DATE* 06/30/1981
LOAD VOL* 303185
DUMP VOL* 303185

START DATE* 07/01/1981
STOP DATE* 07/07/1981
LOAD VOL* 395758

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DUMP VOL*     395758

COMMENT* TOTAL DREDGED 746443 M'3, TOTAL DUMPED 739743 M'3.

REFERENCE* GOVT NWT APPLICATION UNDER FLGA, LETTER FROM B. MILBURN (G
      NWT) TO A.E. GANSKE (DIAND), 12/10/80.

REFERENCE* EPEC CONSULTING WESTERN LTD., 1982. FINAL REPORT DREDGING
      AND CONSTRUCTION OBSERVATIONS OF THE TUKTOYAKTUK POTABLE WATER
      RESERVOIR. PREPARED FOR GOVT NWT. WHITEHORSE; EPEC CONSULTING W
      ESTERN LTD.

REFERENCE* GOVT GNWT, 1981. TUKTOYAKTUK POTABLE WATER RESERVOIR, DRED
      GING COMPONENT. SUBMITTED TO AWAC. WATER AND SANITATION SECTION
       OF GNWT.YELLOWKNIFE.

REFERENCE* DOME PETROLEUM LTD., 1981. AQUARIUS 1981 DREDGING REPORT.
      BEAUFORT SEA CONSTRUCTION (DOME);CALGARY.


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DATASET NUMBER* 81AQU-03
YEAR* 1981
COMPANY & YEAR* DOME/CANMAR 1981
DREDGE NAME* AQUARIUS
DREDGE TYPE* CUTTER SUCTION
PURPOSE* TARSIUT N-44 ISLAND
LOAD NAME* SOUTH TARSIUT BORROW
LOAD LAT*    PROPRIETARY
LOAD LON*    PROPRIETARY
LOAD MIN DEPTH*   7.0
LOAD MAX DEPTH*  12.0
LOAD SEDIMENT* GRAVEL
DUMP NAME* TARSIUT N-44
DUMP LAT*  69.900000
DUMP LON* 136.190000
DUMP MIN DEPTH*  23.0
DUMP MAX DEPTH*  23.0
DUMP METHOD* BARGE
DUMP SEDIMENT* GRAVEL
ISLAND NAME* TARSIUT N-44
ISLAND TYPE* CRI BERM
ISLAND STATUS* DRILLING COMPLETE 1983

  START DATE*  07/10/1981
  STOP DATE*  07/31/1981
  LOAD VOL*     472011
  DUMP VOL*     293103

  START DATE*  08/01/1981
  STOP DATE*  08/13/1981
  LOAD VOL*     278915
  DUMP VOL*     173197

  COMMENT* MONTHLY TOTALS ARE APPROXIMATE. THEY REPRESENT PORTIONS OF
      THE TOTAL VOLUME DREDGED (750.925 M'3) IN THE GIVEN PERIOD.

  COMMENT* LOCATION OF THE GRAVEL LOAD SITE IS UNAVAILABLE DUE TO PROPI
      ETARY RESTRICTIONS.

  REFERENCE* DOME PETROLEUM LTD., 1981. AQUARIUS 1981 DREDGING REPORT.
      BEAUFORT SEA CONSTRUCTION (DOME); CALGARY.


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DATASET NUMBER* 81AQU-04
YEAR* 1981
COMPANY & YEAR* DOME/CANMAR 1981
DREDGE NAME* AQUARIUS
DREDGE TYPE* CUTTER SUCTION
PURPOSE* MCKINLEY BAY HARBOUR MAINTENANCE, MOORING BASIN ACCESS CHANNEL
LOAD NAME* MCKINLEY BAY
LOAD LAT*  69.940000
LOAD LON* 131.220000
LOAD MIN DEPTH*   3.0
LOAD MAX DEPTH*  15.0
LOAD SEDIMENT* SAND, CLAY
DUMP NAME* MCKINLEY BAY NORTH PROTECTION ISLAND
DUMP LAT*  69.960000
DUMP LON* 131.170000
DUMP MIN DEPTH*    .0
DUMP MAX DEPTH*   1.5
DUMP METHOD* PIPELINE DISCHARGE
DUMP SEDIMENT* SAND, CLAY
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  08/13/1981
  STOP DATE*  08/31/1981
  LOAD VOL*      836736
  DUMP VOL*      836736

  START DATE*  09/01/1981
  STOP DATE*  09/30/1981
  LOAD VOL*     1394559
  DUMP VOL*     1394559

  START DATE*  10/01/1981
  STOP DATE*  10/27/1981
  LOAD VOL*     1255105
  DUMP VOL*     1255105

  AUTHORITY REFERENCE* ODCA PERMIT 4443-1194
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AMOUNT LICENSED* 1000000
TERM START* 07/01/1981
TERM COMPLETE* 11/30/1981

COMMENT* ALL MATERIAL DREDGED FROM MOORING BASIN IN 1981 WAS PLACED O
N NORTH PROTECTION ISLAND.

COMMENT* KNOWN INSPECTION DATES; 08/13/81, 09/10/81, 10/26/81.

COMMENT* NORTH PROTECTION ISLAND WAS CONSTRUCTED UNDER PLGA DREDGING
LICENSE AND LEASE.

COMMENT* MONTHLY TOTALS ARE APPROXIMATE. THEY REPRESENT PORTIONS OF
THE TOTAL VOLUME DREDGED (626600 M'3) IN THE GIVEN PERIOD.

REFERENCE* LETTER FROM ED PESSAH (DOME) TO B. WILSON (EPS, YELLOWKNIF
E) 12/28/81.

REFERENCE* GAZETTED LICENSE 3734.

REFERENCE* GAZETTED PERMIT 1194.

REFERENCE* DOME PETROLEUM LTD., 1981. AQUARIUS 1981 DREDGING REPORT.
BEAUFORT SEA CONSTRUCTION (DOME); CALGARY.

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DATASET NUMBER* 81BMZ-01
YEAR* 1981
COMPANY & YEAR* IMPERIAL/ESSO 1981
DREDGE NAME* BEAVER MACKENZIE
DREDGE TYPE* STATIONARY SUCTION
PURPOSE* TUK HARBOUR LAND RECLAMATION
LOAD NAME* TUK HARBOUR
LOAD LAT* 69.420000
LOAD LON* 132.960000
LOAD MIN DEPTH* 3.7
LOAD MAX DEPTH* 7.9
LOAD SEDIMENT* SAND, SILT, GRAVEL
DUMP NAME* TUK HARBOUR (LAND)
DUMP LAT* 69.420000
DUMP LON* 132.950000
DUMP MIN DEPTH* NOT APPLICABLE
DUMP MAX DEPTH* NOT APPLICABLE
DUMP METHOD* PIPELINE DISCHARGE
DUMP SEDIMENT* SAND, SILT, GRAVEL
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

START DATE* 07/15/1981
STOP DATE* 07/18/1981

LOAD VOL* 135000
DUMP VOL* 115000

AUTHORITY REFERENCE* PLGA LIC 3674
AMOUNT LICENSED* 250000
TERM START* 07/10/1981
TERM COMPLETE* 07/31/1981

REFERENCE* GAZETTED LICENSE 3674.

REFERENCE* NOTICE FROM ESSO TO DIAND RE: TUC HARBOUR DREDGING AND LAND RECLAMATION 11/17/81.

REFERENCE* IMPERIAL OIL LTD. 1977. REPORT ON THE 1976 ARCTIC OFFSHORE CONSTRUCTION PROGRAM. PRODUCTION DEPT., WESTERN REGION, OFFSHORE CONSTRUCTION GROUP. FIELD SERVICES, EDMONTON.

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DATASET NUMBER* 81BMZ-02
YEAR* 1981
COMPANY & YEAR* IMPERIAL/ESSO 1981
DREDGE NAME* BEAVER MACKENZIE
DREDGE TYPE* STATIONARY SUCTION
PURPOSE* ALERK P-23 ISLAND
LOAD NAME* ALERK P-23 AREA
LOAD LAT* 69.880000
LOAD LON* 132.840000
LOAD MIN DEPTH* 11.6
LOAD MAX DEPTH* 11.6
LOAD SEDIMENT* SAND, SILT
DUMP NAME* ALERK P-23 ISLAND
DUMP LAT* 69.880000
DUMP LON* 132.840000
DUMP MIN DEPTH* 11.6
DUMP MAX DEPTH* 11.6
DUMP METHOD* PIPELINE DISCHARGE
DUMP SEDIMENT* SAND, SILT
ISLAND NAME* ALERK P-23
ISLAND TYPE* SACRIFICIAL BEACH
ISLAND STATUS* ABANDONED 1982

START DATE* 07/21/1981
STOP DATE* 07/27/1981
LOAD VOL* 245000
DUMP VOL* 215830

START DATE* 07/28/1981
STOP DATE* 07/31/1981
LOAD VOL* 140000
DUMP VOL* 123330

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  START DATE*  08/01/1981
  STOP DATE*  08/31/1981
  LOAD VOL*    1085000
  DUMP VOL*     955840

  START DATE*  09/01/1981
  STOP DATE*  09/06/1981
  LOAD VOL*     210000
  DUMP VOL*     185000

  AUTHORITY REFERENCE* PLGA LEASE 3520
  AMOUNT LICENSED*    1500000
  TERM START*  09/01/1980
  TERM COMPLETE*  09/01/1985

  REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

  REFERENCE* ESSO RESOURCES CANADA LTD., 1982. 1981 BEAUFORT OFFSHORE C
        ONSTRUCTION PROJECT REPORT. PRODUCTION DEPARTMENT FIELD SERVICE
        S. FRONTIER TECHNOLOGY; CALGARY.

  REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF
       FISHERIES AND OCEANS,SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL
       ISLAND SUMMARY.


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DATASET NUMBER* 81BMZ-03
YEAR* 1981
COMPANY & YEAR* IMPERIAL/ESSO 1981
DREDGE NAME* BEAVER MACKENZIE
DREDGE TYPE* STATIONARY SUCTION
PURPOSE* ITIYOK I-27 ISLAND
LOAD NAME* ITIYOK I-27 AREA
LOAD LAT*  69.940000
LOAD LON* 134.090000
LOAD MIN DEPTH*  15.0
LOAD MAX DEPTH*  15.0
LOAD SEDIMENT* SAND
DUMP NAME* ITIYOK I-27 ISLAND
DUMP LAT*  69.940000
DUMP LON* 134.090000
DUMP MIN DEPTH*  15.0
DUMP MAX DEPTH*  15.0
DUMP METHOD* FLOATING PIPELINE
DUMP SEDIMENT* SAND
ISLAND NAME* ITIYOK I-27
ISLAND TYPE* SACRIFICIAL BEACH
ISLAND STATUS* ABANDONED 1983

  START DATE*  07/29/1981
  STOP DATE*  07/31/1981
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LOAD VOL*      20785
DUMP VOL*      20785

START DATE*  08/01/1981
STOP DATE*  08/04/1981
LOAD VOL*      23165
DUMP VOL*      23165

START DATE*  08/11/1981
STOP DATE*  08/14/1981
LOAD VOL*      69902
DUMP VOL*      69902

START DATE*  08/15/1981
STOP DATE*  08/22/1981
LOAD VOL*     145383
DUMP VOL*     145383

START DATE*  08/23/1981
STOP DATE*  08/29/1981
LOAD VOL*     191177
DUMP VOL*     191177

START DATE*  09/21/1981
STOP DATE*  09/22/1981
LOAD VOL*      13100
DUMP VOL*      13100

START DATE*  09/23/1981
STOP DATE*  09/29/1981
LOAD VOL*     104923
DUMP VOL*     104923

START DATE*  10/02/1981
STOP DATE*  10/07/1981
LOAD VOL*      76215
DUMP VOL*      76215

START DATE*  10/08/1981
STOP DATE*  10/08/1981
LOAD VOL*      15875
DUMP VOL*      15875

REFERENCE* ESSO RESOURCES CANADA LTD., 1982. 1981 BEAUFORT OFFSHORE C
      ONSTRUCTION PROJECT REPORT. PRODUCTION DEPARTMENT FIELD SERVICE
      S. FRONTIER TECHNOLOGY; CALGARY.


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DATASET NUMBER* 81BMZ-04
YEAR* 1981
COMPANY & YEAR* IMPERIAL/ESSO 1981
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DREDGE NAME* BEAVER MACKENZIE
DREDGE TYPE* STATIONARY SUCTION
PURPOSE* WEST ATKINSON L-17 ISLAND
LOAD NAME* WEST ATKINSON L-17 AREA
LOAD LAT*  69.780000
LOAD LON* 132.080000
LOAD MIN DEPTH*   7.0
LOAD MAX DEPTH*   7.0
LOAD SEDIMENT* SAND
DUMP NAME* WEST ATKINSON L-17 ISLAND
DUMP LAT*  69.780000
DUMP LON* 132.080000
DUMP MIN DEPTH*   7.0
DUMP MAX DEPTH*   7.0
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* SAND
ISLAND NAME* WEST ATKINSON L-17
ISLAND TYPE* SACRIFICIAL BEACH
ISLAND STATUS* ABANDONED 1982

  START DATE*  09/06/1981
  STOP DATE*  09/07/1981
  LOAD VOL*      48330
  DUMP VOL*      40750

  START DATE*  09/08/1981
  STOP DATE*  09/14/1981
  LOAD VOL*     474900
  DUMP VOL*     421780

  START DATE*  09/15/1981
  STOP DATE*  09/21/1981
  LOAD VOL*     432670
  DUMP VOL*     379570

  AUTHORITY REFERENCE* LAND USE PERMIT N79A089
  AMOUNT LICENSED*    1000000
  TERM START*  07/18/1979
  TERM COMPLETE*  07/16/1983

  REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

  REFERENCE* ESSO RESOURCES CANADA LTD., 1982. 1981 BEAUFORT OFFSHORE C
        ONSTRUCTION PROJECT REPORT. PRODUCTION DEPARTMENT FIELD SERVICE
        S. FRONTIER TECHNOLOGY; CALGARY.


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DATASET NUMBER* 81BMZ-05
YEAR* 1981
COMPANY & YEAR* IMPERIAL/ESSO 1981
DREDGE NAME* BEAVER MACKENZIE
DREDGE TYPE* STATIONARY SUCTION
PURPOSE* ISSERK A-49 DREDGE TESTS
LOAD NAME* ISSERK A-49 AREA
LOAD LAT*  69.970000
LOAD LON* 132.420000
LOAD MIN DEPTH*   1.0
LOAD MAX DEPTH*  38.0
LOAD SEDIMENT* SAND, SILT, CLAY
DUMP NAME* ISSERK A-49 AREA
DUMP LAT*  69.970000
DUMP LON* 134.420000
DUMP MIN DEPTH*   1.0
DUMP MAX DEPTH*  38.0
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* SAND, SILT, CLAY
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  01/01/1981
  STOP DATE*  01/01/1900
  LOAD VOL*        7040
  DUMP VOL*        7040

  REFERENCE* ESSO RESOURCES CANADA LTD., 1982. 1981 BEAUFORT OFFSHORE C
        ONSTRUCTION PROJECT REPORT. PRODUCTION DEPARTMENT FIELD SERVICE
        S. FRONTIER TECHNOLOGY; CALGARY.


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DATASET NUMBER* 81EX1-01
YEAR* 1981
COMPANY & YEAR* GULF CANADA 1981
DREDGE NAME* EXPLORER I
DREDGE TYPE* DRILLSHIP
PURPOSE* NORTH ISSUNGNAK L-86 GLORY HOLE
LOAD NAME* NORTH ISSUNGNAK L-86
LOAD LAT*  70.090000
LOAD LON* 134.450000
LOAD MIN DEPTH*  26.2
LOAD MAX DEPTH*  26.2
LOAD SEDIMENT* SAND, SILT, CLAY
DUMP NAME* NOT APPLICABLE
DUMP LAT*   NOT APPLICABLE
DUMP LON*   NOT APPLICABLE
DUMP MIN DEPTH*   NOT APPLICABLE
DUMP MAX DEPTH*   NOT APPLICABLE
DUMP METHOD* NOT APPLICABLE
DUMP SEDIMENT* NOT APPLICABLE
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE
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  START DATE*  06/29/1981
  STOP DATE*  06/30/1981
  LOAD VOL*        625
  DUMP VOL*        625

  START DATE*  07/01/1981
  STOP DATE*  07/15/1981
  LOAD VOL*       9375
  DUMP VOL*       9375

  REFERENCE* BILL LIVINGSTONE, GULF, PERSONAL COMMUNICATION, 1983.

  REFERENCE* LETTER FROM M. THOMAS (COGLA, YELLOWKNIFE) TO M. REED (DEP
        T. OF FISHERIES AND OCEANS, SIDNEY) 07/06/83.


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DATASET NUMBER* 81GEX-01
YEAR* 1981
COMPANY & YEAR* DOME/CANMAR 1981
DREDGE NAME* GEOPOTES X
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* UVILUK P-66 ISLAND
LOAD NAME* UVILUK P-66 AREA
LOAD LAT*  70.260000
LOAD LON* 132.310000
LOAD MIN DEPTH*  30.0
LOAD MAX DEPTH*  30.0
LOAD SEDIMENT* SAND
DUMP NAME* UVILUK P-66 ISLAND
DUMP LAT*  70.260000
DUMP LON* 132.310000
DUMP MIN DEPTH*  31.0
DUMP MAX DEPTH*  31.0
DUMP METHOD* BOTTOM VALVE AND PUMP OUT
DUMP SEDIMENT* SAND
ISLAND NAME* UVILUK P-66
ISLAND TYPE* SSDC BERM
ISLAND STATUS* ABANDONED 1983

  START DATE*  06/14/1981
  STOP DATE*  06/30/1981
  LOAD VOL*     183379
  DUMP VOL*     183379

  AUTHORITY REFERENCE* PLGA LEASE 3690
  AMOUNT LICENSED*          INFORMATION NOT FOUND IN SEARCH
  TERM START* INFORMATION NOT FOUND IN SEARCH
  TERM STOP* INFORMATION NOT FOUND IN SEARCH

  REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.
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DATASET NUMBER* 81GEX-02
YEAR* 1981
COMPANY & YEAR* DOME/CANMAR 1981
DREDGE NAME* GEOPOTES X
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* TARSIUT N-44 ISLAND
LOAD NAME* SOUTH TARSIUT
LOAD LAT*   PROPRIETARY
LOAD LON*   PROPRIETARY
LOAD MIN DEPTH*   8.0
LOAD MAX DEPTH*  12.0
LOAD SEDIMENT* GRAVEL
DUMP NAME* TARSIUT N-44 ISLAND
DUMP LAT*  69.900000
DUMP LON* 136.190000
DUMP MIN DEPTH*  23.0
DUMP MAX DEPTH*  23.0
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* GRAVEL
ISLAND NAME* TARSIUT N-44
ISLAND TYPE* CRI BERM
ISLAND STATUS* DRILLING COMPLETE 1983

  START DATE*  06/15/1981
  STOP DATE*  06/30/1981
  LOAD VOL*        1185
  DUMP VOL*        1185

  START DATE*  07/01/1981
  STOP DATE*  07/07/1981
  LOAD VOL*         593
  DUMP VOL*         593

  COMMENT* WEEKLY TOTALS ARE APPROXIMATE. THEY REPRESENT PORTIONS OF TH
       E TOTAL VOLUME DREDGED (1778 M'3) IN THE GIVEN PERIOD.

  REFERENCE* DOME PETROLEUM LTD., 1981. ISLAND DREDGING REPORT 1981 SEA
       SON, NOVEMBER 6, 1981.

  REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.


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DATASET NUMBER* 81GEX-03
YEAR* 1981
COMPANY & YEAR* DOME/CANMAR 1981
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DREDGE NAME* GEOPOTES X
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* TARSIUT N-44 ISLAND
LOAD NAME* HERSCHEL AREA B
LOAD LAT*  69.540000
LOAD LON* 138.800000
LOAD MIN DEPTH*   8.0
LOAD MAX DEPTH*  14.0
LOAD SEDIMENT* GRAVEL
DUMP NAME* TARSIUT N-44 ISLAND
DUMP LAT*  69.900000
DUMP LON* 136.190000
DUMP MIN DEPTH*  23.0
DUMP MAX DEPTH*  23.0
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* GRAVEL
ISLAND NAME* TARSIUT N-44
ISLAND TYPE* CRI BERM
ISLAND STATUS* DRILLING COMPLETE 1983

  START DATE*  06/22/1981
  STOP DATE*  06/30/1981
  LOAD VOL*        3654
  DUMP VOL*        3654

  START DATE*  07/01/1981
  STOP DATE*  07/31/1981
  LOAD VOL*       14161
  DUMP VOL*       14161

  START DATE*  08/01/1981
  STOP DATE*  08/31/1981
  LOAD VOL*       14161
  DUMP VOL*       14161

  START DATE*  09/01/1981
  STOP DATE*  09/30/1981
  LOAD VOL*       14161
  DUMP VOL*       14161

  START DATE*  10/01/1981
  STOP DATE*  10/30/1981
  LOAD VOL*       14161
  DUMP VOL*       14161

  AUTHORITY REFERENCE* GAZETTED LICENSE 3693
  AMOUNT LICENSED*     INFORMATION NOT FOUND IN SEARCH
  TERM START*  02/02/1999
  TERM COMPLETE*  02/02/1999

  COMMENT* MONTHLY TOTALS ARE APPROXIMATE. THEY REPRESENT PORTIONS OF
       THE TOTAL VOLUME DREDGED (60298 M'3) IN THE GIVEN PERIOD.

  REFERENCE* DOME PETROLEUM LTD., 1981. ISLAND DREDGING REPORT 1981 SEA
        SON, NOVEMBER 6, 1981.
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REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.


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DATASET NUMBER* 81GEX-04
YEAR* 1981
COMPANY & YEAR* DOME/CANMAR
DREDGE NAME* GEOPOTES X
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* TARSIUT N-44 ISLAND
LOAD NAME* UKALERK
LOAD LAT*  69.830000
LOAD LON* 133.000000
LOAD MIN DEPTH*  16.0
LOAD MAX DEPTH*  18.0
LOAD SEDIMENT* SAND
DUMP NAME* TARSIUT N-44
DUMP LAT*  69.900000
DUMP LON* 136.190000
DUMP MIN DEPTH*  23.0
DUMP MAX DEPTH*  23.0
DUMP METHOD* BOTTOM VALVE AND PUMP OUT
DUMP SEDIMENT* SAND
ISLAND NAME* TARSIUT N-44
ISLAND TYPE* CRI BERM
ISLAND STATUS* COMPLETED 1982

  START DATE*  06/01/1981
  STOP DATE*  06/30/1981
  LOAD VOL*       26149
  DUMP VOL*       26149

  START DATE*  07/01/1981
  STOP DATE*  07/31/1981
  LOAD VOL*      101327
  DUMP VOL*      101327

  START DATE*  08/01/1981
  STOP DATE*  08/30/1981
  LOAD VOL*      101327
  DUMP VOL*      101327

  START DATE*  09/01/1981
  STOP DATE*  09/30/1981
  LOAD VOL*      101327
  DUMP VOL*      101327

  START DATE*  10/01/1981
  STOP DATE*  10/31/1981
  LOAD VOL*      101327
  DUMP VOL*      101327
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COMMENT* MONTHLY TOTALS ARE APPROXIMATE. THEY REPRESENT PORTIONS OF
THE TOTAL VOLUME DREDGED (431458 M'3) IN THE GIVEN PERIOD.

REFERENCE* DOME PETROLEUM LTD., 1981. ISLAND DREDGING REPORT 1981 SEA
SON, 6 NOV 1981.

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DATASET NUMBER* 81GEX-05
YEAR* 1981
COMPANY & YEAR* DOME/CANMAR 1981
DREDGE NAME* GEOPOTES X
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* UVILUK P-66 ISLAND
LOAD NAME* UKALERK
LOAD LAT* 69.830000
LOAD LON* 133.000000
LOAD MIN DEPTH* 16.0
LOAD MAX DEPTH* 18.0
LOAD SEDIMENT* SAND
DUMP NAME* UVILUK P-66 ISLAND
DUMP LAT* 70.260000
DUMP LON* 132.310000
DUMP MIN DEPTH* 31.0
DUMP MAX DEPTH* 31.0
DUMP METHOD* BOTTOM VALVE AND PUMP OUT
DUMP SEDIMENT* SAND
ISLAND NAME* UVILUK P-66
ISLAND TYPE* SSDC BERM
ISLAND STATUS* ABANDONED 1983

START DATE* 07/01/1981
STOP DATE* 07/31/1981
LOAD VOL* 190347
DUMP VOL* 190347

START DATE* 08/01/1981
STOP DATE* 08/31/1981
LOAD VOL* 190347
DUMP VOL* 190347

START DATE* 09/01/1981
STOP DATE* 09/30/1981
LOAD VOL* 190347
DUMP VOL* 190347

START DATE* 10/01/1981
STOP DATE* 10/31/1981
LOAD VOL* 190347
DUMP VOL* 190347

REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.

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DATASET NUMBER* 81GEX-06
YEAR* 1981
COMPANY & YEAR* DOME/CANMAR 1981
DREDGE NAME* GEOPOTES X
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* UVILUK P-66 ISLAND
LOAD NAME* SOUTH TARSIUT
LOAD LAT* PROPRIETARY
LOAD LON* PROPRIETARY
LOAD MIN DEPTH* 8.0
LOAD MAX DEPTH* 12.0
LOAD SEDIMENT* GRAVEL
DUMP NAME* UVILUK P-66 ISLAND
DUMP LAT* 70.260000
DUMP LON* 132.310000
DUMP MIN DEPTH* 31.0
DUMP MAX DEPTH* 31.0
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* GRAVEL
ISLAND NAME* UVILUK P-66
ISLAND TYPE* SSDC BERM
ISLAND STATUS* ABANDONED 1983

START DATE* 07/01/1981
STOP DATE* 07/31/1981
LOAD VOL* 9401
DUMP VOL* 9401

START DATE* 08/01/1981
STOP DATE* 08/31/1981
LOAD VOL* 9401
DUMP VOL* 9401

START DATE* 09/01/1981
STOP DATE* 09/30/1981
LOAD VOL* 9097
DUMP VOL* 9097

START DATE* 10/01/1981
STOP DATE* 10/31/1981
LOAD VOL* 9401
DUMP VOL* 9401

COMMENT* MONTHLY TOTALS ARE APPROXIMATE. THEY REPRESENT PORTIONS OF THE TOTAL VOLUME DREDGED (37300 M'3) IN THE GIVEN PERIOD.

REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.

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DATASET NUMBER* 81GEX-07
YEAR* 1981
COMPANY & YEAR* DOME/CANMAR 1981
DREDGE NAME* GEOPOTES X
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* TARSIUT N-44 ISLAND
LOAD NAME* UKALERK
LOAD LAT*  69.900000
LOAD LON* 136.190000
LOAD MIN DEPTH*  16.0
LOAD MAX DEPTH*  18.0
LOAD SEDIMENT* SAND
DUMP NAME* NORTH SPUR, TARSIUT N-44 ISLAND
DUMP LAT*  68.900000
DUMP LON* 136.190000
DUMP MIN DEPTH*  23.0
DUMP MAX DEPTH*  23.0
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* SAND
ISLAND NAME* TARSIUT N-44
ISLAND TYPE* CRI BERM
ISLAND STATUS* DRILLING COMPLETE 1983

  START DATE*  07/20/1981
  STOP DATE*  07/20/1981
  LOAD VOL*      16534
  DUMP VOL*      16534

  START DATE*  07/22/1981
  STOP DATE*  07/22/1981
  LOAD VOL*       8227
  DUMP VOL*       8227

  AUTHORITY REFERENCE* PLGA LIC 3527
  AMOUNT LICENSED*     INFORMATION NOT FOUND IN SEARCH
  TERM START*  09/12/1980
  TERM COMPLETE*  09/01/1983

  REFERENCE* DOME PETROLEUM LTD., 1982. BEAUFORT SEA CONSTRUCTION DEPAR
        TMENT DAILY REPORTS, 1982.

  REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.


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DATASET NUMBER* 81HZN-01
YEAR* 1981
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COMPANY & YEAR* DOME/CANMAR 1981
DREDGE NAME* HENDRIK ZANEN
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* UVILUK P-66 ISLAND
LOAD NAME* UKALERK
LOAD LAT* 69.830000
LOAD LON* 133.000000
LOAD MIN DEPTH*  16.0
LOAD MAX DEPTH*  18.0
LOAD SEDIMENT* SAND
DUMP NAME* UVILUK P-66 ISLAND
DUMP LAT*  70.260000
DUMP LON* 132.310000
DUMP MIN DEPTH*  31.0
DUMP MAX DEPTH*  31.0
DUMP METHOD* BOTTOM DOORS, SUCTION PIPE
DUMP SEDIMENT* SAND
ISLAND NAME* UVILUK P-66
ISLAND TYPE* SSDC BERM
ISLAND STATUS* ABANDONED 1983

   START DATE*  06/01/1981
   STOP DATE*  06/30/1981
   LOAD VOL*       26000
   DUMP VOL*       26000

   START DATE*  07/01/1981
   STOP DATE*  07/14/1981
   LOAD VOL*       13000
   DUMP VOL*       13000

   COMMENT* WEEKLY TOTALS ARE APPROXIMATE. THEY REPRESENT PORTIONS OF TH
         E TOTAL VOLUME DREDGED (39000 M'3) IN THE GIVEN PERIOD.

   REFERENCE* DOME PETROLEUM LTD., 1981. ISLAND DREDGING REPORT 1981 SEA
         SON, NOVEMBER 6, 1981.

   REFERENCE* DOME PETROLEUM LTD., 1981. HENDRIK ZANEN 1981 DREDGING REP
         ORT. BEAUFORT SEA CONSTRUCTION; CALGARY, SEPT 20, 1981.


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DATASET NUMBER* 81HZN-02
YEAR* 1981
COMPANY & YEAR* DOME/CANMAR 1981
DREDGE NAME* HENDRIK ZANEN
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* TARSIUT N-44 ISLAND
LOAD NAME* SOUTH TARSIUT
LOAD LAT*   PROPRIETARY
LOAD LON*   PROPRIETARY
LOAD MIN DEPTH*   7.0
LOAD MAX DEPTH*  12.0
LOAD SEDIMENT* GRAVEL
DUMP NAME* TARSIUT N-44 ISLAND
DUMP LAT*  69.900000
DUMP LON* 136.190000
DUMP MIN DEPTH*  23.0
DUMP MAX DEPTH*  23.0
DUMP METHOD* BOTTOM DOORS, FLOATING PIPELINE
DUMP SEDIMENT* GRAVEL
ISLAND NAME* TARSIUT N-44
ISLAND TYPE* CRI BERM
ISLAND STATUS* DRILLING COMPLETE 1983

  START DATE*  07/31/1981
  STOP DATE*  07/31/1981
  LOAD VOL*       3000
  DUMP VOL*       3000

  START DATE*  08/01/1981
  STOP DATE*  08/31/1981
  LOAD VOL*     136343
  DUMP VOL*     136343

  START DATE*  09/01/1981
  STOP DATE*  09/30/1981
  LOAD VOL*     136343
  DUMP VOL*     136343

  START DATE*  10/01/1981
  STOP DATE*  10/31/1981
  LOAD VOL*     136343
  DUMP VOL*     136343

  COMMENT* MONTHLY TOTALS ARE APPROXIMATE. THEY REPRESENT PORTIONS OF
       THE TOTAL VOLUME DREDGED (412029 M'3) IN THE GIVEN PERIOD.

  REFERENCE* DOME PETROLEUM LTD., 1981. ISLAND DREDGING REPORT 1981 SEA
        SON, NOVEMBER 6, 1981.


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DATASET NUMBER* 81HZN-03
YEAR* 1981
COMPANY & YEAR* DOME/CANMAR 1981
DREDGE NAME* HENDRIK ZANEN
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* TARSIUT N-44 ISLAND
LOAD NAME* UKALERK
LOAD LAT*  69.830000
LOAD LON* 133.000000
LOAD MIN DEPTH*  16.0
LOAD MAX DEPTH*  18.0
LOAD SEDIMENT* SAND
DUMP NAME* TARSIUT N-44 ISLAND
DUMP LAT*  69.900000
DUMP LON* 136.190000
DUMP MIN DEPTH*  23.0
DUMP MAX DEPTH*  23.0
DUMP METHOD* BOTTOM DOORS, FLOATING PIPELINE
DUMP SEDIMENT* SAND
ISLAND NAME* TARSIUT N-44
ISLAND TYPE* CRI BERM
ISLAND STATUS* DRILLING COMPLETE 1983

  START DATE*  08/01/1981
  STOP DATE*  08/31/1981
  LOAD VOL*       48035
  DUMP VOL*       48035

  START DATE*  09/01/1981
  STOP DATE*  09/30/1981
  LOAD VOL*       46486
  DUMP VOL*       46486

  START DATE*  10/01/1981
  STOP DATE*  10/31/1981
  LOAD VOL*       48035
  DUMP VOL*       48035

  AUTHORITY REFERENCE* FLGA LIC 3527
  AMOUNT LICENSED*     INFORMATION NOT FOUND IN SEARCH
  TERM START*  09/12/1980
  TERM COMPLETE*  09/01/1983

  COMMENT* MONTHLY TOTALS ARE APPROXIMATE. THEY REPRESENT PORTIONS OF
       THE TOTAL VOLUME DREDGED (112256 M'3) IN THE GIVEN PERIOD.

  REFERENCE* DOME PETROLEUM LTD., 1981. ISLAND DREDGING REPORT 1981 SEA
       SON, NOVEMBER 6, 1981.


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DATASET NUMBER* 81HZN-04
YEAR* 1981
COMPANY & YEAR* DOME/CANMAR 1981
DREDGE NAME* HENDRIK ZANEN
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* TARSIUT N-44 ISLAND
LOAD NAME* HERSCHEL AREA B
LOAD LAT*  69.540000
LOAD LON* 138.800000
LOAD MIN DEPTH*   8.0
LOAD MAX DEPTH*  14.0
LOAD SEDIMENT* GRAVEL
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DUMP NAME* TARSIUT N-44 ISLAND
DUMP LAT*  69.900000
DUMP LON* 136.190000
DUMP MIN DEPTH*  23.0
DUMP MAX DEPTH*  23.0
DUMP METHOD* FLOATING PIPELINE
DUMP SEDIMENT* GRAVEL
ISLAND NAME* TARSIUT N-44
ISLAND TYPE* CRI BERM
ISLAND STATUS* DRILLING COMPLETE 1983

  START DATE*  08/01/1981
  STOP DATE*  08/31/1981
  LOAD VOL*        4713
  DUMP VOL*        4713

  START DATE*  09/01/1981
  STOP DATE*  09/30/1981
  LOAD VOL*        4712
  DUMP VOL*        4712

  START DATE*  10/01/1981
  STOP DATE*  10/31/1981
  LOAD VOL*        4713
  DUMP VOL*        4713

  AUTHORITY REFERENCE* FLGA LIC 3693
  AMOUNT LICENSED*     200000
  TERM START*  08/14/1981
  TERM COMPLETE*  11/01/1981

  COMMENT* MONTHLY TOTALS ARE APPROXIMATE. THEY REPRESENT PORTIONS OF
       THE TOTAL VOLUME DREDGED (14138 M'3) IN THE GIVEN PERIOD.

  REFERENCE* DOME PETROLEUM LTD., 1981. ISLAND DREDGING REPORT 1981 SEA
        SON, NOVEMBER 6, 1981.

  REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.


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DATASET NUMBER* 81HZN-05
YEAR* 1981
COMPANY & YEAR* DOME/CANMAR 1981
DREDGE NAME* HENDRIK ZANEN
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* TARSIUT N-44 ISLAND
LOAD NAME* ISSERK
LOAD LAT*  69.650000
LOAD LON* 134.200000
LOAD MIN DEPTH*  16.0
LOAD MAX DEPTH*  18.0
LOAD SEDIMENT* SAND
DUMP NAME* TARSIUT N-44 ISLAND
DUMP LAT* 69.900000
DUMP LON* 136.190000
DUMP MIN DEPTH* 23.0
DUMP MAX DEPTH* 23.0
DUMP METHOD* BOTTOM DOORS
DUMP SEDIMENT* SAND
ISLAND NAME* TARSIUT N-44
ISLAND TYPE* CRI BERM
ISLAND STATUS* DRILLING COMPLETE 1983

  START DATE*  08/01/1981
  STOP DATE*  08/31/1981
  LOAD VOL*        6613
  DUMP VOL*        6613

  START DATE*  09/01/1981
  STOP DATE*  09/30/1981
  LOAD VOL*        6612
  DUMP VOL*        6612

  START DATE*  10/01/1981
  STOP DATE*  10/31/1981
  LOAD VOL*        6613
  DUMP VOL*        6613

  AUTHORITY REFERENCE* PLGA LIC 3527
  AMOUNT LICENSED*     INFORMATION NOT FOUND IN SEARCH
  TERM START*  09/12/1980
  TERM COMPLETE*  09/01/1983

  COMMENT* MONTHLY TOTALS ARE APPROXIMATE. THEY REPRESENT PORTIONS OF
      THE TOTAL VOLUME DREDGED (19838 M'3) IN THE GIVEN PERIOD.

  REFERENCE* DOME PETROLEUM LTD., 1981. ISLAND DREDGING REPORT 1981 SEA
       SON, NOVEMBER 6, 1981.


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DATASET NUMBER* 81UNK-01
YEAR* 1981
COMPANY & YEAR* ARCTIC TRANSPORTATION LTD. 1981
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* INFORMATION NOT FOUND IN SEARCH
PURPOSE* TUK HARBOUR DOCK CONSTRUCTION AND FILL
LOAD NAME* TUK HARBOUR
LOAD LAT* 69.420000
LOAD LON* 132.990000
LOAD MIN DEPTH*   3.4
LOAD MAX DEPTH*   3.7
LOAD SEDIMENT* GRANULAR MATERIAL
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DUMP NAME* TUK HARBOUR (LAND) WITHIN 1000 METRES OF DREDGE SITE TO THE
      NORTH WEST.
DUMP LAT*  69.420000
DUMP LON* 132.990000
DUMP MIN DEPTH*   1.5
DUMP MAX DEPTH*   3.4
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* GRANULAR MATERIAL
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  01/01/1981
  STOP DATE*  01/01/1900
  LOAD VOL*       5100
  DUMP VOL*       5100

  AUTHORITY REFERENCE* PLGA LIC 3681
  AMOUNT LICENSED*      18000
  TERM START*  09/10/1981
  TERM COMPLETE*  10/01/1981

  REFERENCE* LETTER FROM N. GRIDLEY (AESL) TO A.E. GANKE (DIAND), 04/14
      /81.

  REFERENCE* GAZETTED LICENSE 3681.

  REFERENCE* LETTER FROM J. SPROULE TO F. ADLEM (DIAND), 04/08/82.


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DATASET NUMBER* 82AQU-01
YEAR* 1982
COMPANY & YEAR* GULF CANADA 1982
DREDGE NAME* AQUARIUS AND EXPLORER I
DREDGE TYPE* CUTTER SUCTION
PURPOSE* KIGGAVIK A-43 GLORY HOLE
LOAD NAME* KIGGAVIK A-43
LOAD LAT*  69.870000
LOAD LON* 135.590000
LOAD MIN DEPTH*  18.0
LOAD MAX DEPTH*  18.0
LOAD SEDIMENT* SILT, CLAY
DUMP NAME* NOT APPLICABLE
DUMP LAT*   NOT APPLICABLE
DUMP LON*   NOT APPLICABLE
DUMP MIN DEPTH*   NOT APPLICABLE
DUMP MAX DEPTH*   NOT APPLICABLE
DUMP METHOD* SIDE CAST
DUMP SEDIMENT* NOT APPLICABLE
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  07/12/1982
  STOP DATE*  07/21/1982
  LOAD VOL*       49000
  DUMP VOL*       49000

  REFERENCE* BILL LIVINGSTONE, GULF, PERSONAL COMMUNICATION, 1983.

  REFERENCE* LETTER FROM M. THOMAS (COGLA, YELLOWKNIFE) TO M. REED (DEP
       T. OF FISHERIES AND OCEANS, SIDNEY) 07/06/83.


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DATASET NUMBER* 82AQU-02
YEAR* 1982
COMPANY & YEAR* DOME/CANMAR 1982
DREDGE NAME* AQUARIUS
DREDGE TYPE* CUTTER SUCTION
PURPOSE* NERLERK B-67 ISLAND
LOAD NAME* NERLERK B-67 AREA
LOAD LAT*  70.420000
LOAD LON* 133.500000
LOAD MIN DEPTH*  45.0
LOAD MAX DEPTH*  45.0
LOAD SEDIMENT* SAND
DUMP NAME* NERLERK B-67 ISLAND
DUMP LAT*  70.430000
DUMP LON* 133.300000
DUMP MIN DEPTH*  45.0
DUMP MAX DEPTH*  45.0
DUMP METHOD* PIPELINE DISCHARGE
DUMP SEDIMENT* SAND
ISLAND NAME* NERLERK B-67
ISLAND TYPE* CRI BERM
ISLAND STATUS* SUSPENDED AUGUST 1983 DUE TO GEOTECHNICAL PROBLEMS

  START DATE*  09/23/1982
  STOP DATE*  09/30/1982
  LOAD VOL*      356380
  DUMP VOL*      356380

  START DATE*  10/01/1982
  STOP DATE*  10/07/1982
  LOAD VOL*      139440
  DUMP VOL*      139440

  START DATE*  10/08/1982
  STOP DATE*  10/14/1982
  LOAD VOL*      367860
  DUMP VOL*      367860
  START DATE*  10/15/1982
  STOP DATE*  10/22/1982
  LOAD VOL*     347960
  DUMP VOL*     347960

  REFERENCE* DOME PETROLEUM LTD., 1982. BEAUFORT SEA CONSTRUCTION DEPAR
        TMENT DAILY REPORTS, 1982.


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DATASET NUMBER* 82BMZ-01
YEAR* 1982
COMPANY & YEAR* IMPERIAL/ESSO 1982
DREDGE NAME* BEAVER MACKENZIE
DREDGE TYPE* STATIONARY SUCTION
PURPOSE* TUK HARBOUR LAND RECLAMATION
LOAD NAME* TUK HARBOUR
LOAD LAT*  69.420000
LOAD LON* 132.960000
LOAD MIN DEPTH*   3.7
LOAD MAX DEPTH*   7.9
LOAD SEDIMENT* SAND, SILT, GRAVEL
DUMP NAME* TUK HARBOUR (LAND)
DUMP LAT*  69.420000
DUMP LON* 132.950000
DUMP MIN DEPTH*   NOT APPLICABLE
DUMP MAX DEPTH*   NOT APPLICABLE
DUMP METHOD* FLOATING PIPELINE
DUMP SEDIMENT* SAND, SILT, GRAVEL
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  07/04/1982
  STOP DATE*  07/07/1982
  LOAD VOL*      50436
  DUMP VOL*      50436

  START DATE*  07/08/1982
  STOP DATE*  07/14/1982
  LOAD VOL*      88264
  DUMP VOL*      88264

  AUTHORITY REFERENCE* PLGA LIC 3805
  AMOUNT LICENSED*     115000
  TERM START*  06/30/1982
  TERM COMPLETE*  07/31/1982

  COMMENT* LAND RECLAMATION ON ESSO LAND LEASE 2922.

  REFERENCE* GAZETTED LICENSE 3805.
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REFERENCE* NOTICE FROM ESSO TO DIAND 12/14/82.

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DATASET NUMBER* 82BMZ-02
YEAR* 1982
COMPANY & YEAR* IMPERIAL/ESSO 1982
DREDGE NAME* BEAVER MACKENZIE
DREDGE TYPE* STATIONARY SUCTION
PURPOSE* TUFT POINT BREAKWATER
LOAD NAME* TUFT POINT
LOAD LAT* 69.670000
LOAD LON* 132.650000
LOAD MIN DEPTH* 4.3
LOAD MAX DEPTH* 4.6
LOAD SEDIMENT* SAND
DUMP NAME* TUFT POINT
DUMP LAT* 69.670000
DUMP LON* 132.650000
DUMP MIN DEPTH* 4.3
DUMP MAX DEPTH* 4.6
DUMP METHOD* PIPELINE DISCHARGE
DUMP SEDIMENT* SAND
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

START DATE* 07/16/1982
STOP DATE* 07/21/1982
LOAD VOL* 22900
DUMP VOL* 22900

AUTHORITY REFERENCE* PLGA LIC 3808
AMOUNT LICENSED* 1000000
TERM START* 02/02/1999
TERM COMPLETE* 10/30/1982

REFERENCE* DREDGING LICENSE APPLICATION FROM M. SHAW (ESSO) TO J. DUNLOP (DIAND) 07/04/83.

REFERENCE* LETTER FROM E. BENNETT (ESSO) TO A. REDSHAW (DIAND) 04/14/83.

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DATASET NUMBER* 82BMZ-03
YEAR* 1982
COMPANY & YEAR* IMPERIAL/ESSO 1982
DREDGE NAME* BEAVER MACKENZIE

DREDGE TYPE* STATIONARY SUCTION
PURPOSE* ITIYOK I-27 ISLAND
LOAD NAME* ITIYOK I-27 AREA
LOAD LAT* 69.940000
LOAD LON* 134.090000
LOAD MIN DEPTH* 15.0
LOAD MAX DEPTH* 15.0
LOAD SEDIMENT* SAND
DUMP NAME* ITIYOK I-27 ISLAND
DUMP LAT* 69.940000
DUMP LON* 134.090000
DUMP MIN DEPTH* 15.0
DUMP MAX DEPTH* 15.0
DUMP METHOD* PIPELINE DISCHARGE
DUMP SEDIMENT* SAND
ISLAND NAME* ITIYOK I-27
ISLAND TYPE* SACRIFICIAL BEACH
ISLAND STATUS* ABANDONED 1983

START DATE* 07/22/1982
STOP DATE* 07/31/1982
LOAD VOL* 433920
DUMP VOL* 251450

START DATE* 08/01/1982
STOP DATE* 08/31/1982
LOAD VOL* 1222860
DUMP VOL* 708620

START DATE* 09/01/1982
STOP DATE* 09/30/1982
LOAD VOL* 1183410
DUMP VOL* 685760

START DATE* 10/01/1982
STOP DATE* 10/13/1982
LOAD VOL* 512810
DUMP VOL* 297170

REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF FISHERIES AND OCEANS,SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL ISLAND SUMMARY.

REFERENCE* ESSO RESOURCES LTD., 1982. W.D.GATEWAY DAILY REPORTS, 1982.

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DATASET NUMBER* 82GEX-01
YEAR* 1982
COMPANY & YEAR* DOME/CANMAR 1982
DREDGE NAME* GEOPOTES X

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DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* UVILUK P-66 ISLAND
LOAD NAME* KAGLULIK SOUTH 50
LOAD LAT*  70.110000
LOAD LON* 131.750000
LOAD MIN DEPTH*  20.0
LOAD MAX DEPTH*  25.0
LOAD SEDIMENT* SAND
DUMP NAME* UVILUK P-66 ISLAND
DUMP LAT*  70.260000
DUMP LON* 132.310000
DUMP MIN DEPTH*  31.0
DUMP MAX DEPTH*  31.0
DUMP METHOD* BOTTOM VALVE
DUMP SEDIMENT* SAND
ISLAND NAME* UVILUK P-66
ISLAND TYPE* SSDC BERM
ISLAND STATUS* ABANDONED 1983

  START DATE*  07/06/1982
  STOP DATE*  07/07/1982
  LOAD VOL*      30861
  DUMP VOL*      30861

  REFERENCE* DOME PETROLEUM LTD., 1982. BEAUFORT SEA CONSTRUCTION DEPAR
        TMENT DAILY REPORTS, 1982.


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DATASET NUMBER* 82GEX-02
YEAR* 1982
COMPANY & YEAR* DOME/CANMAR 1982
DREDGE NAME* GEOPOTES X
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* NERLERK F-67 ISLAND (CANCELLED)
LOAD NAME* NERLERK AREA
LOAD LAT*  70.340000
LOAD LON* 133.330000
LOAD MIN DEPTH* INFORMATION NOT FOUND IN SEARCH
LOAD MAX DEPTH* INFORMATION NOT FOUND IN SEARCH
LOAD SEDIMENT* SAND
DUMP NAME* NERLERK F-67 ISLAND
DUMP LAT*   INFORMATION NOT FOUND IN SEARCH
DUMP LON*   INFORMATION NOT FOUND IN SEARCH
DUMP MIN DEPTH* INFORMATION NOT FOUND IN SEARCH
DUMP MAX DEPTH* INFORMATION NOT FOUND IN SEARCH
DUMP METHOD* BOTTOM VALVE
DUMP SEDIMENT* SAND
ISLAND NAME* NERLERK F-67
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* OPERATION CANCELLED 1982
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  START DATE*  07/08/1982
  STOP DATE*  07/08/1982
  LOAD VOL*        4000
  DUMP VOL*        4000

  REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.


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DATASET NUMBER* 82GEX-03
YEAR* 1982
COMPANY & YEAR* DOME/CANMAR 1982
DREDGE NAME* GEOPOTES X
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* UVILUK P-66 ISLAND
LOAD NAME* UKALERK
LOAD LAT*  69.830000
LOAD LON* 133.000000
LOAD MIN DEPTH*  16.0
LOAD MAX DEPTH*  18.0
LOAD SEDIMENT* SAND
DUMP NAME* UVILUK P-66 ISLAND
DUMP LAT*  70.260000
DUMP LON* 132.310000
DUMP MIN DEPTH*  31.0
DUMP MAX DEPTH*  31.0
DUMP METHOD* BOTTOM VALVE
DUMP SEDIMENT* SAND
ISLAND NAME* UVILUK P-66
ISLAND TYPE* SSDC BERM
ISLAND STATUS* ABANDONED 1983

  START DATE*  07/07/1982
  STOP DATE*  07/07/1982
  LOAD VOL*        8109

  START DATE*  07/09/1982
  STOP DATE*  07/14/1982
  LOAD VOL*      149115
  DUMP VOL*      149115
  DUMP VOL*        8109

  START DATE*  07/20/1982
  STOP DATE*  07/22/1982
  LOAD VOL*       49748
  DUMP VOL*       49748

  START DATE*  07/24/1982
  STOP DATE*  07/27/1982
  LOAD VOL*       65556
  DUMP VOL*       65556
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    START DATE*  07/30/1982
    STOP DATE*  07/30/1982
    LOAD VOL*        24604
    DUMP VOL*        24604

    REFERENCE* DOME PETROLEUM LTD., 1982. BEAUFORT SEA CONSTRUCTION DEPAR
          TMENT DAILY REPORTS, 1982.


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  DATASET NUMBER* 82GEX-04
  YEAR* 1982
  COMPANY & YEAR* DOME/CANMAR 1982
  DREDGE NAME* GEOPOTES X
  DREDGE TYPE* TRAILING SUCTION HOPPER
 PURPOSE* NERLERK J-77 ISLAND (CANCELLED)
  LOAD NAME* UKALERK
  LOAD LAT*  69.830000
  LOAD LON* 133.000000
  LOAD MIN DEPTH*  16.0
  LOAD MAX DEPTH*  18.0
  LOAD SEDIMENT* SAND
  DUMP NAME* NERLERK J-77 ISLAND
  DUMP LAT*  70.450000
  DUMP LON* 133.280000
  DUMP MIN DEPTH* INFORMATION NOT FOUND IN SEARCH
  DUMP MAX DEPTH* INFORMATION NOT FOUND IN SEARCH
  DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
  DUMP SEDIMENT* SAND
  ISLAND NAME* NERLERK J-77
  ISLAND TYPE* NOT APPLICABLE
  ISLAND STATUS* OPERATION CANCELLED 1982

    START DATE*  07/22/1982
    STOP DATE*  07/22/1982
    LOAD VOL*         8345
    DUMP VOL*         8345

    START DATE*  07/23/1982
    STOP DATE*  07/31/1982
    LOAD VOL*       104024
    DUMP VOL*       104024

    START DATE*  08/01/1982
    STOP DATE*  08/01/1982
    LOAD VOL*        24764
    DUMP VOL*        24764

    REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.
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DATASET NUMBER* 82GEX-05
YEAR* 1982
COMPANY & YEAR* DOME/CANMAR 1982
DREDGE NAME* GEOPOTES X
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* UVILUK P-66 ISLAND
LOAD NAME* BANKS ISLAND
LOAD LAT*  71.500000
LOAD LON* 123.580000
LOAD MIN DEPTH*  22.0
LOAD MAX DEPTH*  25.0
LOAD SEDIMENT* GRAVEL
DUMP NAME* UVILUK P-66 ISLAND
DUMP LAT*  70.260000
DUMP LON* 132.310000
DUMP MIN DEPTH*  31.0
DUMP MAX DEPTH*  31.0
DUMP METHOD* PUMP OUT
DUMP SEDIMENT* GRAVEL
ISLAND NAME* UVILUK P-66
ISLAND TYPE* SSDC BERM
ISLAND STATUS* ABANDONED 1983

  START DATE*  08/04/1982
  STOP DATE*  08/04/1982
  LOAD VOL*       7610
  DUMP VOL*       7610

  START DATE*  08/06/1982
  STOP DATE*  08/07/1982
  LOAD VOL*      14438
  DUMP VOL*      14438

  START DATE*  08/11/1982
  STOP DATE*  08/14/1982
  LOAD VOL*      13464
  DUMP VOL*      13464

  START DATE*  08/15/1982
  STOP DATE*  08/15/1982
  LOAD VOL*       6969
  DUMP VOL*       6969

  START DATE*  08/17/1982
  STOP DATE*  08/17/1982
  LOAD VOL*       6443
  DUMP VOL*       6443

  START DATE*  10/08/1982
  STOP DATE*  10/14/1982
  LOAD VOL*      21806
  DUMP VOL*      21806
```

AUTHORITY REFERENCE* PLGA LIC 3821
AMOUNT LICENSED* INFORMATION NOT FOUND IN SEARCH
TERM START* 02/02/1999
TERM COMPLETE* 12/31/1982

REFERENCE* DOME PETROLEUM LTD., 1982. BEAUFORT SEA CONSTRUCTION DEPARTMENT DAILY REPORTS, 1982.

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DATASET NUMBER* 82GEX-06
YEAR* 1982
COMPANY & YEAR* DOME/CANMAR 1982
DREDGE NAME* GEOPOTES X
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* NERLERK B-67 BERM
LOAD NAME* UKALERK
LOAD LAT* 69.830000
LOAD LON* 133.000000
LOAD MIN DEPTH* 16.0
LOAD MAX DEPTH* 18.0
LOAD SEDIMENT* SAND
DUMP NAME* NERLERK B-67 ISLAND
DUMP LAT* 70.430000
DUMP LON* 133.300000
DUMP MIN DEPTH* 45.0
DUMP MAX DEPTH* 45.0
DUMP METHOD* BOTTOM VALVE
DUMP SEDIMENT* SAND
ISLAND NAME* NERLERK B-67
ISLAND TYPE* SSDC BERM
ISLAND STATUS* SUSPENDED AUGUST 1983 DUE TO GEOTECHNICAL PROBLEMS

START DATE* 08/20/1982
STOP DATE* 08/22/1982
LOAD VOL* 45650
DUMP VOL* 45650

START DATE* 08/23/1982
STOP DATE* 08/31/1982
LOAD VOL* 231909
DUMP VOL* 231909

START DATE* 09/01/1982
STOP DATE* 09/07/1982
LOAD VOL* 179265
DUMP VOL* 179265

START DATE* 09/08/1982
STOP DATE* 09/14/1982
LOAD VOL* 72005

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  DUMP VOL*      72005

  START DATE*  09/15/1982
  STOP DATE*  09/22/1982
  LOAD VOL*     159296
  DUMP VOL*     159296

  START DATE*  09/23/1982
  STOP DATE*  09/30/1982
  LOAD VOL*     226880
  DUMP VOL*     226880

  START DATE*  10/02/1982
  STOP DATE*  10/07/1982
  LOAD VOL*     160166
  DUMP VOL*     160166

  START DATE*  10/16/1982
  STOP DATE*  10/19/1982
  LOAD VOL*      65094
  DUMP VOL*      65094

  REFERENCE* DOME PETROLEUM LTD., 1982. BEAUFORT SEA CONSTRUCTION DEPAR
        TMENT DAILY REPORTS, 1982.

  REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.


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DATASET NUMBER* 82GEX-07
YEAR* 1982
COMPANY & YEAR* DOME/CANMAR 1982
DREDGE NAME* GEOPOTES X
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* TINGMIARK CLAY REMOVAL
LOAD NAME* TINGMIARK
LOAD LAT*  70.180000
LOAD LON* 132.750000
LOAD MIN DEPTH* INFORMATION NOT FOUND IN SEARCH
LOAD MAX DEPTH* INFORMATION NOT FOUND IN SEARCH
LOAD SEDIMENT* SAND, CLAY
DUMP NAME* TINGMIARK
DUMP LAT*  70.180000
DUMP LON* 132.750000
DUMP MIN DEPTH* INFORMATION NOT FOUND IN SEARCH
DUMP MAX DEPTH* INFORMATION NOT FOUND IN SEARCH
DUMP METHOD* BOTTOM VALVE
DUMP SEDIMENT* CLAY, SAND
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE
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  START DATE*  08/18/1982
  STOP DATE*  08/20/1982
  LOAD VOL*       60706
  DUMP VOL*       60706

  COMMENT* DUMP LAT AND LON REFER TO APPROXIMATE CENTER OF TINGMIARK TR
        ACT.
  REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.


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DATASET NUMBER* 82GIX-01
YEAR* 1982
COMPANY & YEAR* GULF CANADA 1982
DREDGE NAME* GEOPOTES IX
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* EAST AMAULIGAK I-44 GLORY HOLE
LOAD NAME* EAST AMAULIGAK I-44
LOAD LAT*  70.060000
LOAD LON* 133.710000
LOAD MIN DEPTH*  31.5
LOAD MAX DEPTH*  31.5
LOAD SEDIMENT* SILT, CLAY
DUMP NAME* NOT APPLICABLE
DUMP LAT*   NOT APPLICABLE
DUMP LON*   NOT APPLICABLE
DUMP MIN DEPTH*   NOT APPLICABLE
DUMP MAX DEPTH*   NOT APPLICABLE
DUMP METHOD* NOT APPLICABLE
DUMP SEDIMENT* NOT APPLICABLE
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  07/21/1982
  STOP DATE*  07/31/1982
  LOAD VOL*        4443
  DUMP VOL*        4443

  START DATE*  08/01/1982
  STOP DATE*  08/31/1982
  LOAD VOL*       13774
  DUMP VOL*       13774

  START DATE*  09/01/1982
  STOP DATE*  09/30/1982
  LOAD VOL*       13330
  DUMP VOL*       13330

  START DATE*  10/01/1982
  STOP DATE*  10/17/1982
  LOAD VOL*       7553
  DUMP VOL*       7553

  REFERENCE* BILL LIVINGSTONE, GULF, PERSONAL COMMUNICATION, 1983.

  REFERENCE* LETTER FROM M. THOMAS (COGLA, YELLOWKNIFE) TO M. REED (DEP
        T. OF FISHERIES AND OCEANS, SIDNEY) 07/06/83.

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DATASET NUMBER* 82GIX-02
YEAR* 1982
COMPANY & YEAR* GULF CANADA 1982
DREDGE NAME* GEOPOTES IX
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* STRIPPING AT KOGYUK N-67 ISLAND
LOAD NAME* KOGYUK N-67
LOAD LAT*  70.110000
LOAD LON* 133.330000
LOAD MIN DEPTH*  15.0
LOAD MAX DEPTH*  20.0
LOAD SEDIMENT* SILT, CLAY
DUMP NAME* KOGYUK N-67 ISLAND
DUMP LAT*  70.110000
DUMP LON* 133.330000
DUMP MIN DEPTH*  20.0
DUMP MAX DEPTH*  28.0
DUMP METHOD* HOPPER DISCHARGE
DUMP SEDIMENT* SILT, CLAY
ISLAND NAME* KOGYUK N-67
ISLAND TYPE* CRI BERM
ISLAND STATUS* OPERATIONAL WINTER 1983

  START DATE*  07/19/1982
  STOP DATE*  07/23/1982
  LOAD VOL*      38200
  DUMP VOL*      38200

  AUTHORITY REFERENCE* PLGA LIC 3823, LEASE 3810
  AMOUNT LICENSED*    2000000
  TERM START*  01/14/1982
  TERM COMPLETE*  06/01/1984

  REFERENCE* BILL LIVINGSTONE, GULF, PERSONAL COMMUNICATION, 1983.


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DATASET NUMBER* 82GIX-03
YEAR* 1982
COMPANY & YEAR* GULF CANADA 1982
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DREDGE NAME* GEOPOTES IX
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* KOGYUK N-67 BERM
LOAD NAME* KOGYUK N-67 BERM
LOAD LAT* 69.830000
LOAD LON*  133.000000
LOAD MIN DEPTH*  15.0
LOAD MAX DEPTH*  20.0
LOAD SEDIMENT* SAND
DUMP NAME* KOGYUK N-67 ISLAND
DUMP LAT*  70.110000
DUMP LON* 133.330000
DUMP MIN DEPTH*  28.0
DUMP MAX DEPTH*  28.0
DUMP METHOD* HOPPER DISCHARGE
DUMP SEDIMENT* SAND
ISLAND NAME* KOGYUK N-67
ISLAND TYPE* CRI BERM
ISLAND STATUS* OPERATIONAL WINTER 1983

  START DATE*  07/24/1982
  STOP DATE*  07/31/1982
  LOAD VOL*       61120
  DUMP VOL*       61120

  START DATE*  08/01/1982
  STOP DATE*  08/31/1982
  LOAD VOL*      236840
  DUMP VOL*      236840

  START DATE*  09/01/1982
  STOP DATE*  09/30/1982
  LOAD VOL*      229200
  DUMP VOL*      229200

  START DATE*  10/01/1982
  STOP DATE*  10/06/1982
  LOAD VOL*       45840
  DUMP VOL*       45840

  AUTHORITY REFERENCE* PLGA LIC 3823
  AMOUNT LICENSED*     2070000
  TERM START*  07/23/1982
  TERM COMPLETE*  06/01/1984

  REFERENCE* DALE LONGLITZ, 1983 SAND AND GRAVEL DIRECTORY, DIAND.

  REFERENCE* BILL LIVINGSTONE, GULF, PERSONAL COMMUNICATION, 1983.


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DATASET NUMBER* 82HZN-01
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YEAR* 1982
COMPANY & YEAR* DOME/CANMAR 1982
DREDGE NAME* HENDRIK ZANEN
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* UVILUK P-66 ISLAND
LOAD NAME* KAGLULIK SOUTH 50
LOAD LAT*  70.110000
LOAD LON* 131.750000
LOAD MIN DEPTH*  20.0
LOAD MAX DEPTH*  25.0
LOAD SEDIMENT* SAND
DUMP NAME* UVILUK P-66 ISLAND
DUMP LAT*  70.260000
DUMP LON* 132.310000
DUMP MIN DEPTH*  30.0
DUMP MAX DEPTH*  30.0
DUMP METHOD* FLOATING PIPELINE
DUMP SEDIMENT* SAND
ISLAND NAME* UVILUK P-66
ISLAND TYPE* SSDC BERM
ISLAND STATUS* ABANDONED 1983

  START DATE*  07/06/1982
  STOP DATE*  07/06/1982
  LOAD VOL*      12500
  DUMP VOL*      12500

  REFERENCE* DOME PETROLEUM LTD., 1982. BEAUFORT SEA CONSTRUCTION DEPAR
        TMENT DAILY REPORTS, 1982.


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DATASET NUMBER* 82HZN-02
YEAR* 1982
COMPANY & YEAR* DOME/CANMAR 1982
DREDGE NAME* HENDRIK ZANEN
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* NERLERK F-67 ISLAND (CANCELLED)
LOAD NAME* NERLERK RIDGE
LOAD LAT*  70.250000
LOAD LON* 133.370000
LOAD MIN DEPTH*  28.0
LOAD MAX DEPTH*  28.0
LOAD SEDIMENT* SAND
DUMP NAME* NERLERK F-67 ISLAND
DUMP LAT*   INFORMATION NOT FOUND IN SEARCH
DUMP LON*   INFORMATION NOT FOUND IN SEARCH
DUMP MIN DEPTH*  40.0
DUMP MAX DEPTH*  40.0
DUMP METHOD* BOTTOM VALVE
DUMP SEDIMENT* SAND
ISLAND NAME* NERLERK F-67
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* OPERATION CANCELLED 1982

  START DATE*  07/08/1982
  STOP DATE*  07/08/1982
  LOAD VOL*       9863
  DUMP VOL*       9863

  REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.


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DATASET NUMBER* 82HZN-03
YEAR* 1982
COMPANY & YEAR* DOME/CANMAR 1982
DREDGE NAME* HENDRIK ZANEN
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* UVILUK P-66 ISLAND
LOAD NAME* UKALERK
LOAD LAT*  69.830000
LOAD LON* 133.000000
LOAD MIN DEPTH*  16.0
LOAD MAX DEPTH*  18.0
LOAD SEDIMENT* SAND
DUMP NAME* UVILUK P-66 ISLAND
DUMP LAT*  70.260000
DUMP LON* 132.310000
DUMP MIN DEPTH*  30.0
DUMP MAX DEPTH*  30.0
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* SAND
ISLAND NAME* UVILUK P-66
ISLAND TYPE* SSDC BERM
ISLAND STATUS* ABANDONED 1983

  START DATE*  07/10/1982
  STOP DATE*  07/14/1982
  LOAD VOL*      87633
  DUMP VOL*      87633

  START DATE*  07/15/1982
  STOP DATE*  07/18/1982
  LOAD VOL*      83385
  DUMP VOL*      83385

  START DATE*  07/20/1982
  STOP DATE*  07/22/1982
  LOAD VOL*      51724
  DUMP VOL*      51724

  START DATE*  07/23/1982
  STOP DATE*  07/27/1982
  LOAD VOL*      65661
  DUMP VOL*      65661

  START DATE*  07/30/1982
  STOP DATE*  07/31/1982
  LOAD VOL*      15573
  DUMP VOL*      15573

  START DATE*  08/09/1982
  STOP DATE*  08/31/1982
  LOAD VOL*       3425
  DUMP VOL*       3425

  START DATE*  09/01/1982
  STOP DATE*  09/09/1982
  LOAD VOL*       1401
  DUMP VOL*       1401

  START DATE*  10/22/1982
  STOP DATE*  10/22/1982
  LOAD VOL*       4800
  DUMP VOL*       4800

  REFERENCE* DOME PETROLEUM LTD., 1982. BEAUFORT SEA CONSTRUCTION DEPAR
        TMENT DAILY REPORTS, 1982.


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DATASET NUMBER* 82HZN-04
YEAR* 1982
COMPANY & YEAR* DOME/CANMAR 1982
DREDGE NAME* HENDRIK ZANEN
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* NERLERK J-77 ISLAND
LOAD NAME* UKALERK
LOAD LAT*  69.830000
LOAD LON* 133.000000
LOAD MIN DEPTH*  16.0
LOAD MAX DEPTH*  18.0
LOAD SEDIMENT* SAND
DUMP NAME* NERLERK J-77 ISLAND
DUMP LAT*  70.450000
DUMP LON* 133.280000
DUMP MIN DEPTH* INFORMATION NOT FOUND IN SEARCH
DUMP MAX DEPTH* INFORMATION NOT FOUND IN SEARCH
DUMP METHOD* BOTTOM DOORS
DUMP SEDIMENT* SAND
ISLAND NAME* NERLERK J-77
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* OPERATION CANCELLED

  START DATE*  07/24/1982
  STOP DATE*  07/31/1982
  LOAD VOL*      45188
  DUMP VOL*      45188

  START DATE*  08/01/1982
  STOP DATE*  08/06/1982
  LOAD VOL*      57337
  DUMP VOL*      57337

  START DATE*  08/13/1982
  STOP DATE*  08/14/1982
  LOAD VOL*      17542
  DUMP VOL*      17542

  REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.


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DATASET NUMBER* 82HZN-05
YEAR* 1982
COMPANY & YEAR* DOME/CANMAR 1982
DREDGE NAME* HENDRIK ZANEN
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* UVILUK P-66 ISLAND
LOAD NAME* SOUTH TARSIUT
LOAD LAT*   PROPRIETARY
LOAD LON*   PROPRIETARY
LOAD MIN DEPTH*   7.0
LOAD MAX DEPTH*  12.0
LOAD SEDIMENT* GRAVEL
DUMP NAME* UVILUK P-66 ISLAND
DUMP LAT*  70.260000
DUMP LON* 132.310000
DUMP MIN DEPTH*  30.0
DUMP MAX DEPTH*  30.0
DUMP METHOD* SUCTION PIPELINE
DUMP SEDIMENT* GRAVEL
ISLAND NAME* UVILUK P-66
ISLAND TYPE* SSDC BERM
ISLAND STATUS* ABANDONED 1983

  START DATE*  08/05/1982
  STOP DATE*  08/07/1982
  LOAD VOL*      11933
  DUMP VOL*      11933

  START DATE*  08/08/1982
  STOP DATE*  08/08/1982
  LOAD VOL*       3496
  DUMP VOL*       3496

  START DATE*  08/10/1982
  STOP DATE*  08/10/1982
  LOAD VOL*        3754
  DUMP VOL*        3754

  START DATE*  08/15/1982
  STOP DATE*  08/15/1982
  LOAD VOL*        2951
  DUMP VOL*        2951

  START DATE*  10/15/1982
  STOP DATE*  10/15/1982
  LOAD VOL*        7515
  DUMP VOL*        7515

  REFERENCE* DOME PETROLEUM LTD., 1982. BEAUFORT SEA CONSTRUCTION DEPAR
        TMENT DAILY REPORTS, 1982.


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DATASET NUMBER* 82HZN-06
YEAR* 1982
COMPANY & YEAR* DOME/CANMAR 1982
DREDGE NAME* HENDRIK ZANEN
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* MCKINLEY BAY SSDC PAD CONSTRUCTION
LOAD NAME* UKALERK
LOAD LAT*  69.830000
LOAD LON* 133.000000
LOAD MIN DEPTH*  16.0
LOAD MAX DEPTH*  18.0
LOAD SEDIMENT* SAND
DUMP NAME* MCKINLEY BAY
DUMP LAT*  69.940000
DUMP LON* 131.170000
DUMP MIN DEPTH*   6.0
DUMP MAX DEPTH*   8.0
DUMP METHOD* PIPELINE DISCHARGE
DUMP SEDIMENT* SAND
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  08/11/1982
  STOP DATE*  08/11/1982
  LOAD VOL*        4208
  DUMP VOL*        4208

  START DATE*  08/16/1982
  STOP DATE*  08/16/1982
  LOAD VOL*        3897
  DUMP VOL*        3897
  START DATE*  10/23/1982
  STOP DATE*  10/25/1982
  LOAD VOL*       14157
  DUMP VOL*       14157

  REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.

  REFERENCE* DOME PETROLEUM LTD., 1982. BEAUFORT SEA CONSTRUCTION DEPAR
        TMENT DAILY REPORTS, 1982.


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DATASET NUMBER* 82HZN-07
YEAR* 1982
COMPANY & YEAR* DOME/CANMAR 1982
DREDGE NAME* HENDRIK ZANEN
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* MCKINLEY BAY SSDC PAD CONSTRUCTION
LOAD NAME* KAGLULIK SOUTH 50
LOAD LAT*  70.110000
LOAD LON* 131.750000
LOAD MIN DEPTH*  20.0
LOAD MAX DEPTH*  25.0
LOAD SEDIMENT* SAND
DUMP NAME* MCKINLEY BAY
DUMP LAT*  69.940000
DUMP LON* 131.170000
DUMP MIN DEPTH*   6.0
DUMP MAX DEPTH*   8.0
DUMP METHOD* FLOATING PIPELINE
DUMP SEDIMENT* SAND
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  08/11/1982
  STOP DATE*  08/13/1982
  LOAD VOL*       12467
  DUMP VOL*       12467

  START DATE*  08/17/1982
  STOP DATE*  08/17/1982
  LOAD VOL*        3406
  DUMP VOL*        3406

  START DATE*  09/15/1982
  STOP DATE*  09/15/1982
  LOAD VOL*        4534
  DUMP VOL*        4534

  REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.
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REFERENCE* DOME PETROLEUM LTD., 1982. BEAUFORT SEA CONSTRUCTION DEPARTMENT DAILY REPORTS, 1982.

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DATASET NUMBER* 82HZN-08
YEAR* 1982
COMPANY & YEAR* DOME/CANMAR 1982
DREDGE NAME* HENDRIK ZANEN
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* MAINTENANCE AT TARSIUT N-44 ISLAND
LOAD NAME* UKALERK
LOAD LAT* 69.830000
LOAD LON* 133.000000
LOAD MIN DEPTH* 16.0
LOAD MAX DEPTH* 18.0
LOAD SEDIMENT* SAND
DUMP NAME* TARSIUT N-44 ISLAND
DUMP LAT* 69.900000
DUMP LON* 136.190000
DUMP MIN DEPTH* 4.0
DUMP MAX DEPTH* 7.0
DUMP METHOD* SUCTION PIPE OVER BOW
DUMP SEDIMENT* SAND
ISLAND NAME* TARSIUT N-44
ISLAND TYPE* CRI BERM
ISLAND STATUS* DRILLING COMPLETE 1983

START DATE* 08/18/1982
STOP DATE* 08/20/1982
LOAD VOL* 17463
DUMP VOL* 17463

REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.

****

DATASET NUMBER* 82HZN-09
YEAR* 1982
COMPANY & YEAR* DOME/CANMAR 1982
DREDGE NAME* HENDRIK ZANEN
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* NERLERK B-67 BERM
LOAD NAME* UKALERK
LOAD LAT* 69.830000
LOAD LON* 133.000000
LOAD MIN DEPTH* 16.0
LOAD MAX DEPTH* 18.0
LOAD SEDIMENT* SAND

```
DUMP NAME* NERLERK B-67 ISLAND
DUMP LAT*  70.430000
DUMP LON* 133.300000
DUMP MIN DEPTH*  45.0
DUMP MAX DEPTH*  45.0
DUMP METHOD* BOTTOM DOORS
DUMP SEDIMENT* SAND
ISLAND NAME* NERLERK B-67
ISLAND TYPE* SSDC BERM
ISLAND STATUS* SUSPENDED AUGUST 1983 DUE TO GEOTECHNICAL PROBLEMS

  START DATE*  08/21/1982
  STOP DATE*  08/22/1982
  LOAD VOL*       29213
  DUMP VOL*       29213

  START DATE*  08/23/1982
  STOP DATE*  08/31/1982
  LOAD VOL*      154810
  DUMP VOL*      154810

  START DATE*  09/01/1982
  STOP DATE*  09/07/1982
  LOAD VOL*      129770
  DUMP VOL*      129770

  START DATE*  09/08/1982
  STOP DATE*  09/14/1982
  LOAD VOL*      127729
  DUMP VOL*      127729

  START DATE*  09/15/1982
  STOP DATE*  09/15/1982
  LOAD VOL*        4939
  DUMP VOL*        4939

  START DATE*  09/17/1982
  STOP DATE*  09/22/1982
  LOAD VOL*       85376
  DUMP VOL*       85376

  START DATE*  09/23/1982
  STOP DATE*  09/30/1982
  LOAD VOL*      151697
  DUMP VOL*      151697

  START DATE*  10/02/1982
  STOP DATE*  10/07/1982
  LOAD VOL*      104339
  DUMP VOL*      104339

  START DATE*  10/08/1982
  STOP DATE*  10/14/1982
  LOAD VOL*       77653
  DUMP VOL*       77653
```

REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.

REFERENCE* DOME PETROLEUM LTD., 1982. BEAUFORT SEA CONSTRUCTION DEPARTMENT DAILY REPORTS, 1982.

****

DATASET NUMBER* 82HZN-10
YEAR* 1982
COMPANY & YEAR* DOME/CANMAR 1982
DREDGE NAME* HENDRIK ZANEN
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* NERLERK B-67 BERM
LOAD NAME* UKALERK
LOAD LAT* 69.830000
LOAD LON* 133.000000
LOAD MIN DEPTH* 16.0
LOAD MAX DEPTH* 18.0
LOAD SEDIMENT* SAND
DUMP NAME* NERLERK B-67 ISLAND
DUMP LAT* 70.430000
DUMP LON* 133.300000
DUMP MIN DEPTH* 45.0
DUMP MAX DEPTH* 45.0
DUMP METHOD* BOTTOM DOORS
DUMP SEDIMENT* SAND
ISLAND NAME* NERLERK B-67
ISLAND TYPE* SSDC BERM
ISLAND STATUS* BERM COLLAPSED AUGUST 1983

START DATE* 08/13/1982
STOP DATE* 08/13/1982
LOAD VOL* 4231
DUMP VOL* 4231

START DATE* 10/17/1982
STOP DATE* 10/19/1982
LOAD VOL* 44280
DUMP VOL* 44280

REFERENCE* GLEN BURNS, DOME, PERSONAL COMMUNICATION, 1983.

REFERENCE* DOME PETROLEUM LTD., 1982. BEAUFORT SEA CONSTRUCTION DEPARTMENT DAILY REPORTS, 1982.

****

DATASET NUMBER* 82UNK-01

```
YEAR* 1982
COMPANY & YEAR* DOME/CANMAR 1982
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* INFORMATION NOT FOUND IN SEARCH
PURPOSE* NATIAK O-44 GLORY HOLE
LOAD NAME* NATIAK O-44
LOAD LAT*  70.070000
LOAD LON* 137.220000
LOAD MIN DEPTH*  44.0
LOAD MAX DEPTH*  44.0
LOAD SEDIMENT* INFORMATION NOT FOUND IN SEARCH
DUMP NAME* NOT APPLICABLE
DUMP LAT*   NOT APPLICABLE
DUMP LON*   NOT APPLICABLE
DUMP MIN DEPTH*   NOT APPLICABLE
DUMP MAX DEPTH*   NOT APPLICABLE
DUMP METHOD* NOT APPLICABLE
DUMP SEDIMENT* NOT APPLICABLE
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  10/17/1982
  STOP DATE*  10/21/1982
  LOAD VOL*      18519
  DUMP VOL*      18519

  COMMENT* THIS VOLUME IS APPROXIMATE.

  COMMENT* THIS GLORY HOLE WAS ABANDONED IN 1982 AND SPUDDING WAS RESUM
       ED IN 1983.

  REFERENCE* ED PESSAH, DOME, PERSONAL COMMUNICATION, 1983.

  REFERENCE* LETTER FROM M. THOMAS (COGLA, YELLOWKNIFE) TO M. REED (DEP
       T. OF FISHERIES AND OCEANS, SIDNEY) 07/06/83.


            *********************


DATASET NUMBER* 82UNK-02
YEAR* 1982
COMPANY & YEAR* ARCTIC TRANSPORTATION LTD. 1982
DREDGE NAME* INFORMATION NOT FOUND IN SEARCH
DREDGE TYPE* INFORMATION NOT FOUND IN SEARCH
PURPOSE* TUK HARBOUR DOCK CONSTRUCTION AND FILL
LOAD NAME* TUK HARBOUR
LOAD LAT*  69.420000
LOAD LON* 132.990000
LOAD MIN DEPTH*   3.4
LOAD MAX DEPTH*   3.4
LOAD SEDIMENT* GRANULAR MATERIAL
DUMP NAME* TUK HARBOUR (LAND) WITHIN 1000 METRES OF DREDGE SITE TO THE
```

```
     NORTH WEST
DUMP LAT*  69.420000
DUMP LON* 132.990000
DUMP MIN DEPTH*   1.5
DUMP MAX DEPTH*   3.4
DUMP METHOD* SIDECAST
DUMP SEDIMENT* GRANULAR MATERIAL
ISLAND NAME* NOT APPLICABLE
ISLAND TYPE* NOT APPLICABLE
ISLAND STATUS* NOT APPLICABLE

  START DATE*  01/01/1982
  STOP DATE*  01/01/1900
  LOAD VOL*        9000
  DUMP VOL*        9000

  AUTHORITY REFERENCE* FLGA LIC 3806
  AMOUNT LICENSED*       12000
  TERM START*  07/05/1982
  TERM COMPLETE*  02/02/1999

  REFERENCE* GAZETTED LICENSE 3806.

  REFERENCE* AWAC MINUTES JUNE 22-23, 1982, #72.


              **********************


DATASET NUMBER* 82WDG-01
YEAR* 1982
COMPANY & YEAR* IMPERIAL/ESSO 1982
DREDGE NAME* W.D. GATEWAY
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* ITIYOK I-27 ISLAND
LOAD NAME* UKALERK
LOAD LAT*  69.830000
LOAD LON* 133.000000
LOAD MIN DEPTH*  16.0
LOAD MAX DEPTH*  18.0
LOAD SEDIMENT* SAND
DUMP NAME* ITIYOK I-27 ISLAND
DUMP LAT*  69.940000
DUMP LON* 134.090000
DUMP MIN DEPTH*  15.0
DUMP MAX DEPTH*  15.0
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* SAND
ISLAND NAME* ITIYOK I-27
ISLAND TYPE* SACRIFICIAL BEACH
ISLAND STATUS* ABANDONED 1983

  START DATE*  08/01/1982
  STOP DATE*  08/07/1982
```

LOAD VOL* 176600
DUMP VOL* 176600

START DATE* 08/08/1982
STOP DATE* 08/08/1982
LOAD VOL* 41700
DUMP VOL* 41700

START DATE* 08/22/1982
STOP DATE* 08/22/1982
LOAD VOL* 9700
DUMP VOL* 9700

REFERENCE* ESSO RESOURCES LTD., 1982. W.D.GATEWAY DAILY REPORTS, 1982.

REFERENCE* LETTER FROM D.BUTCHKO (ESSO) TO B. SMILEY (DEPT. OF FISHERIES AND OCEANS,SIDNEY) 03/12/84 RE; ARCTIC ARTIFICIAL ISLAND SUMMARY.

****

DATASET NUMBER* 82WDG-02
YEAR* 1982
COMPANY & YEAR* IMPERIAL/ESSO 1982
DREDGE NAME* W.D. GATEWAY
DREDGE TYPE* TRAILING SUCTION HOPPER
PURPOSE* KADLUK O-07 ISLAND
LOAD NAME* UKALERK
LOAD LAT* 69.830000
LOAD LON* 133.000000
LOAD MIN DEPTH* 16.0
LOAD MAX DEPTH* 18.0
LOAD SEDIMENT* SAND
DUMP NAME* KADLUK O-07 ISLAND
DUMP LAT* 69.790000
DUMP LON* 136.000000
DUMP MIN DEPTH* 13.6
DUMP MAX DEPTH* 13.6
DUMP METHOD* BOTTOM DUMP, BOW DISCHARGE
DUMP SEDIMENT* SAND
ISLAND NAME* KADLUK O-07
ISLAND TYPE* CRI BERM
ISLAND STATUS* BERM COMPLETED 1983, DRILLING INITIATED SEPT. 1983

START DATE* 08/09/1982
STOP DATE* 08/14/1982
LOAD VOL* 70900
DUMP VOL* 70900

START DATE* 08/15/1982
STOP DATE* 08/22/1982
LOAD VOL* 79200

```
    DUMP VOL*      79200

    START DATE*  08/23/1982
    STOP DATE*  08/31/1982
    LOAD VOL*     102200
    DUMP VOL*     102200

    START DATE*  09/01/1982
    STOP DATE*  09/07/1982
    LOAD VOL*     102200
    DUMP VOL*     102200

    START DATE*  09/08/1982
    STOP DATE*  09/14/1982
    LOAD VOL*      71900
    DUMP VOL*      71900

    START DATE*  09/15/1982
    STOP DATE*  09/22/1982
    LOAD VOL*      59200
    DUMP VOL*      59200

    START DATE*  09/23/1982
    STOP DATE*  09/25/1982
    LOAD VOL*      24300
    DUMP VOL*      24300

    AUTHORITY REFERENCE* PLGA LIC 3825
    AMOUNT LICENSED*     600000
    TERM START*  08/01/1982
    TERM COMPLETE*  06/01/1984

    REFERENCE* ESSO RESOURCES LTD., 1982. W.D.GATEWAY DAILY REPORTS, 1982.


    REFERENCE* IMPERIAL OIL LTD., 1983. 1982 CRI CONSTRUCTION PERFORMANCE
           REPORT (DRAFT). PRODUCTION DEPARTMENT FIELD SERVICES. FRONTIER
           TECHNOLOGY; CALGARY.


              **********************


  DATASET NUMBER* 82WDG-03
  YEAR* 1982
  COMPANY & YEAR* IMPERIAL/ESSO 1982
  DREDGE NAME* W.D. GATEWAY
  DREDGE TYPE* TRAILING SUCTION HOPPER
  PURPOSE* MINUK I-53 ISLAND
  LOAD NAME* UKALERK
  LOAD LAT*  69.830000
  LOAD LON* 133.000000
  LOAD MIN DEPTH*  16.0
  LOAD MAX DEPTH*  18.0
```

```
LOAD SEDIMENT* SAND
DUMP NAME* MINUK I-53 ISLAND
DUMP LAT*  69.710000
DUMP LON* 136.460000
DUMP MIN DEPTH*  14.7
DUMP MAX DEPTH*  14.7
DUMP METHOD* INFORMATION NOT FOUND IN SEARCH
DUMP SEDIMENT* SAND
ISLAND NAME* MINUK I-53
ISLAND TYPE* CRI BERM
ISLAND STATUS* BERM COMPLETED 1983, DRILLING PLANNED NOV. 1985

  START DATE*  09/27/1982
  STOP DATE*  09/30/1982
  LOAD VOL*      29700
  DUMP VOL*      29700

  START DATE*  10/01/1982
  STOP DATE*  10/07/1982
  LOAD VOL*      64000
  DUMP VOL*      64000

  START DATE*  10/08/1982
  STOP DATE*  10/14/1982
  LOAD VOL*      62817
  DUMP VOL*      62817

  START DATE*  10/15/1982
  STOP DATE*  10/20/1982
  LOAD VOL*      44848
  DUMP VOL*      44848

  REFERENCE* IMPERIAL OIL LTD., 1983. 1982 CRI CONSTRUCTION PERFORMANCE
         REPORT (DRAFT). PRODUCTION DEPARTMENT FIELD SERVICES. FRONTIER
         TECHNOLOGY; CALGARY.

  REFERENCE* ESSO RESOURCES LTD., 1982. W.D.GATEWAY DAILY REPORTS, 1982.

EOF:5862 SCAN:42
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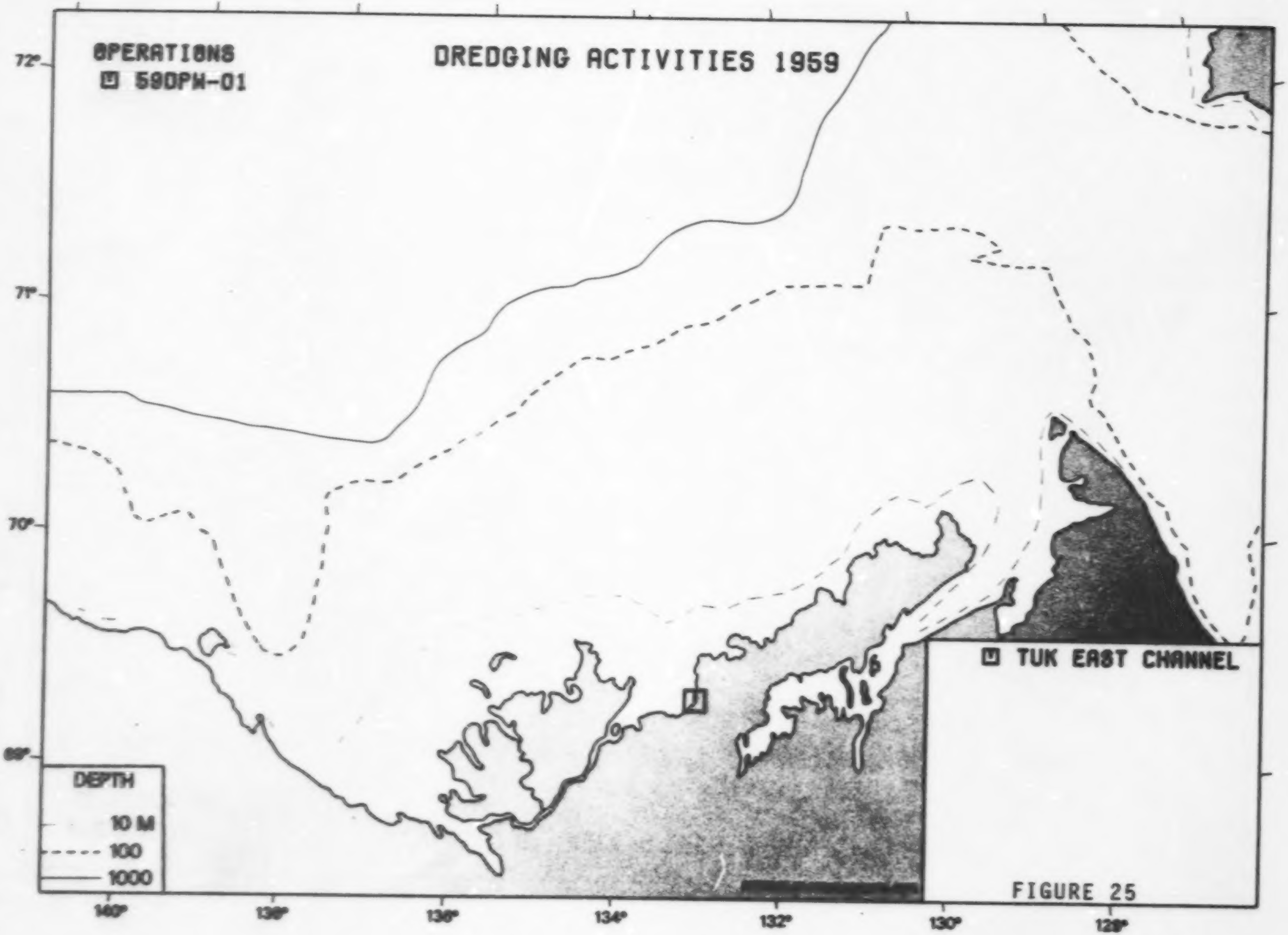
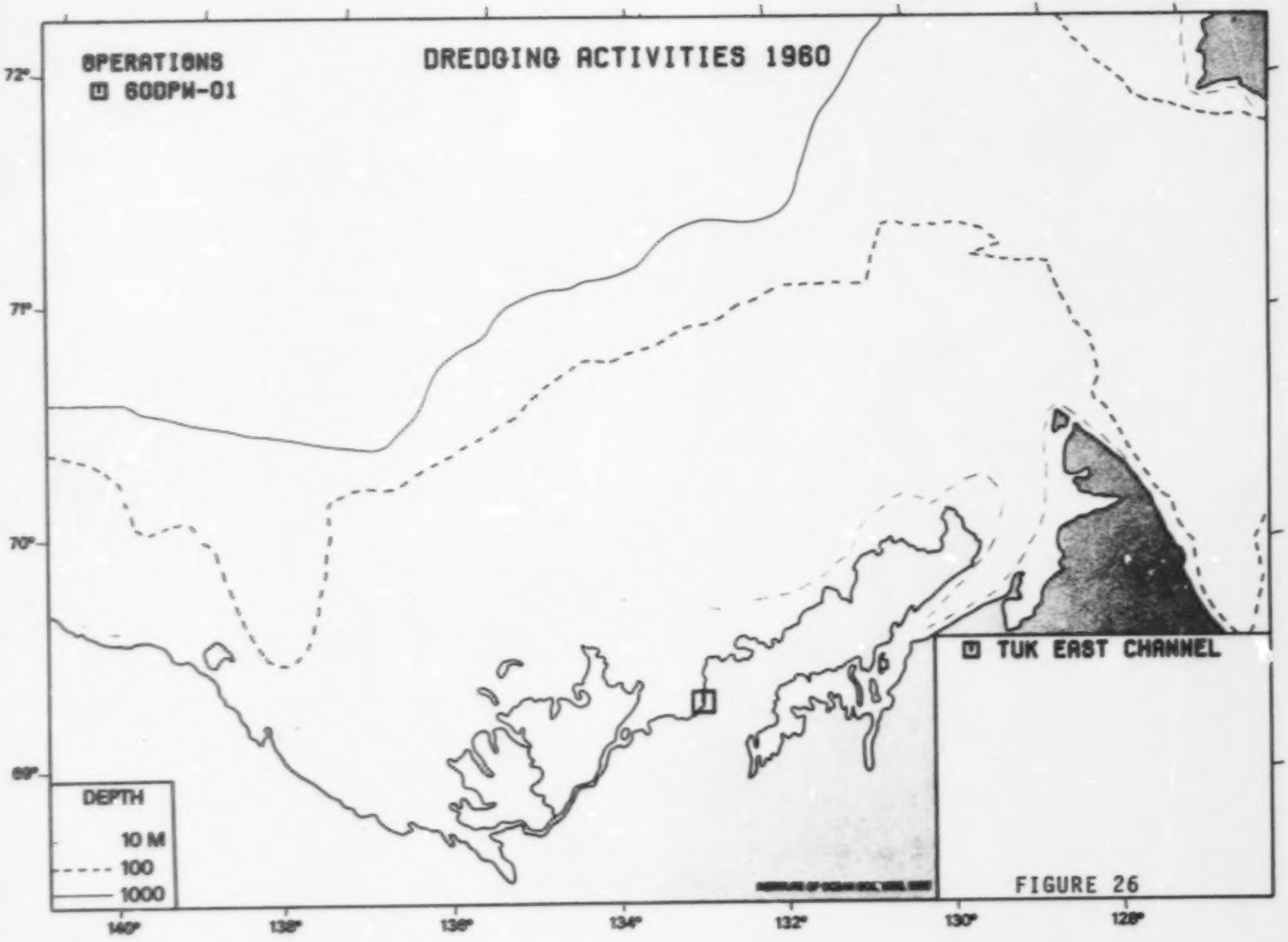


DREDGING ACTIVITIES 1959

FIGURE 25



DREDGING ACTIVITIES 1960

FIGURE 26

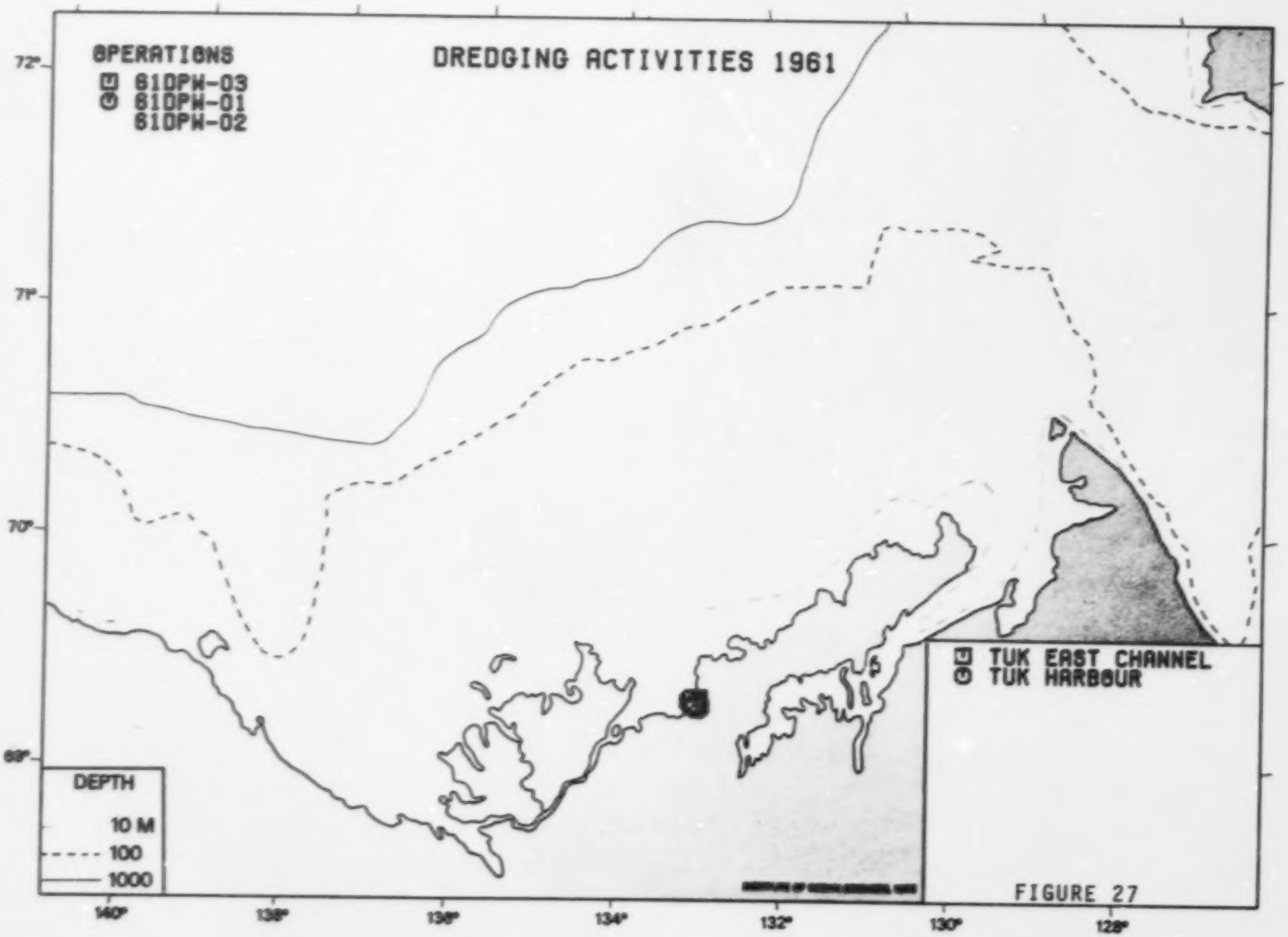
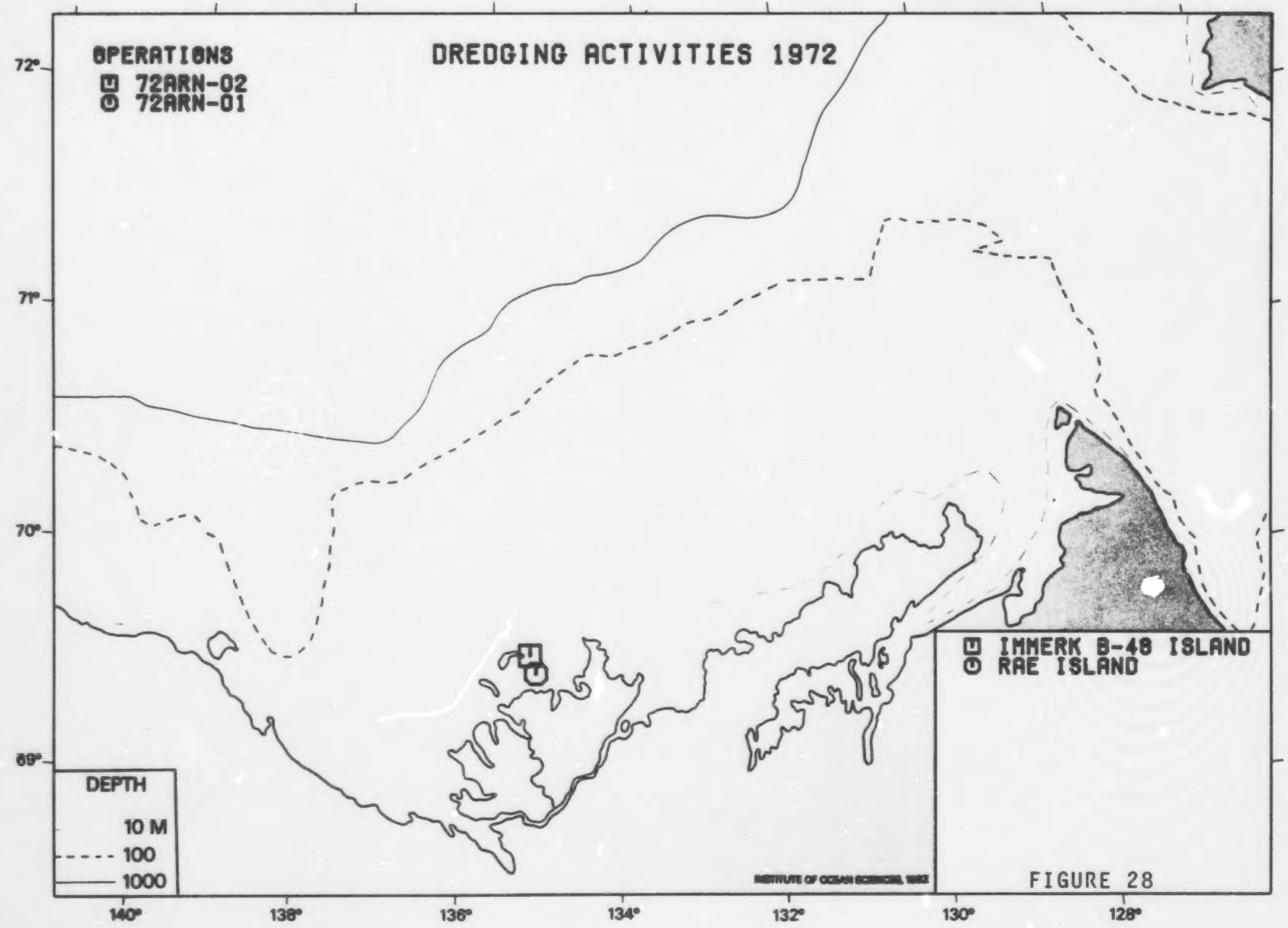

DREDGING ACTIVITIES 1961
OPERATIONS
⊡ 61DPW-03
⊙ 61DPW-01
61DPW-02
⊡ TUK EAST CHANNEL
⊙ TUK HARBOUR
DEPTH
10 M
100
1000
72°
71°
70°
69°
140°
138°
136°
134°
132°
130°
128°

FIGURE 27



DREDGING ACTIVITIES 1972

FIGURE 28

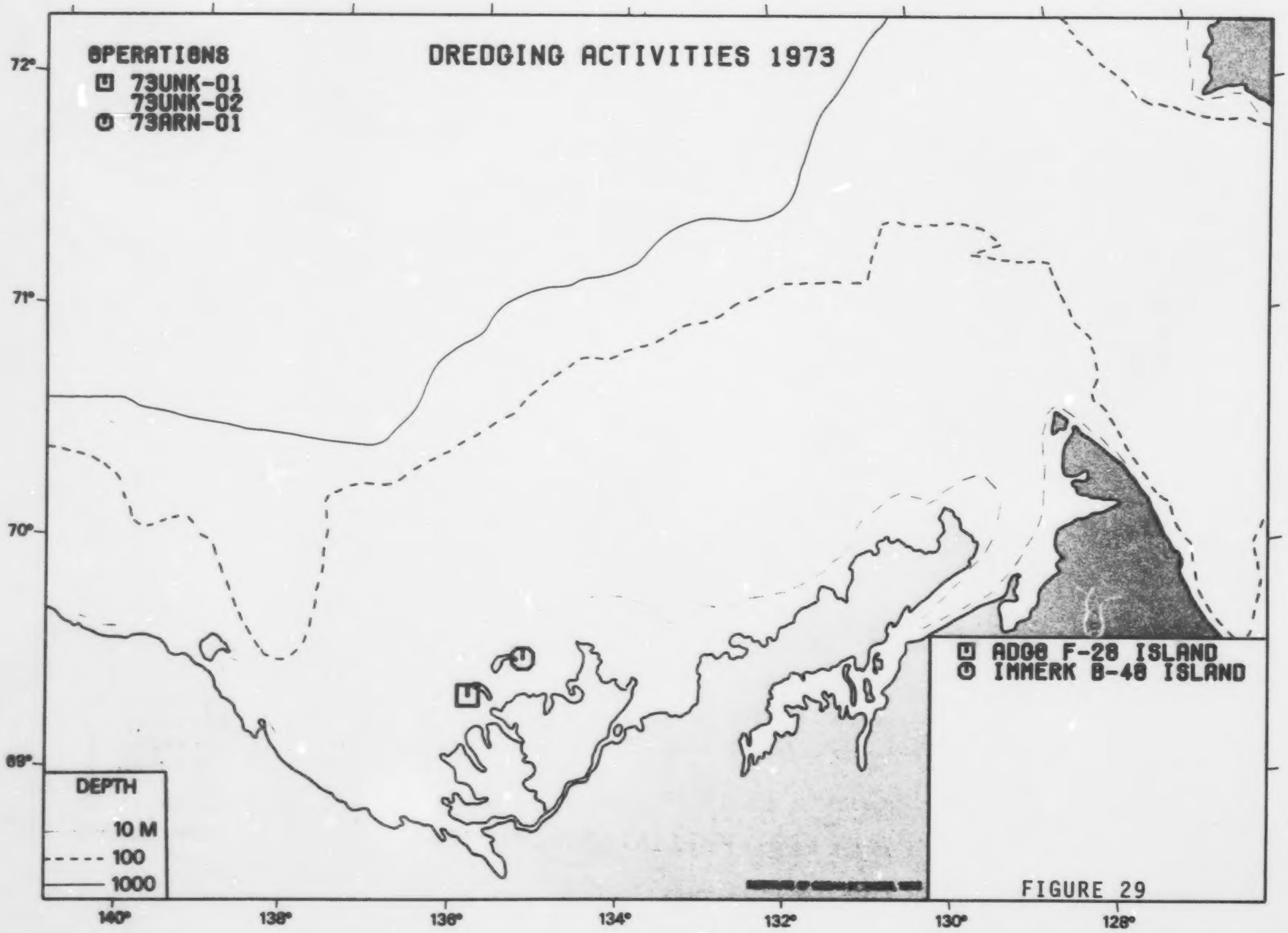

DREDGING ACTIVITIES 1973
OPERATIONS
73UNK-01
73UNK-02
73ARN-01
ADGO F-28 ISLAND
IMMERK B-48 ISLAND
DEPTH
10 M
100
1000
72°
71°
70°
69°
140°
138°
136°
134°
132°
130°
128°

FIGURE 29

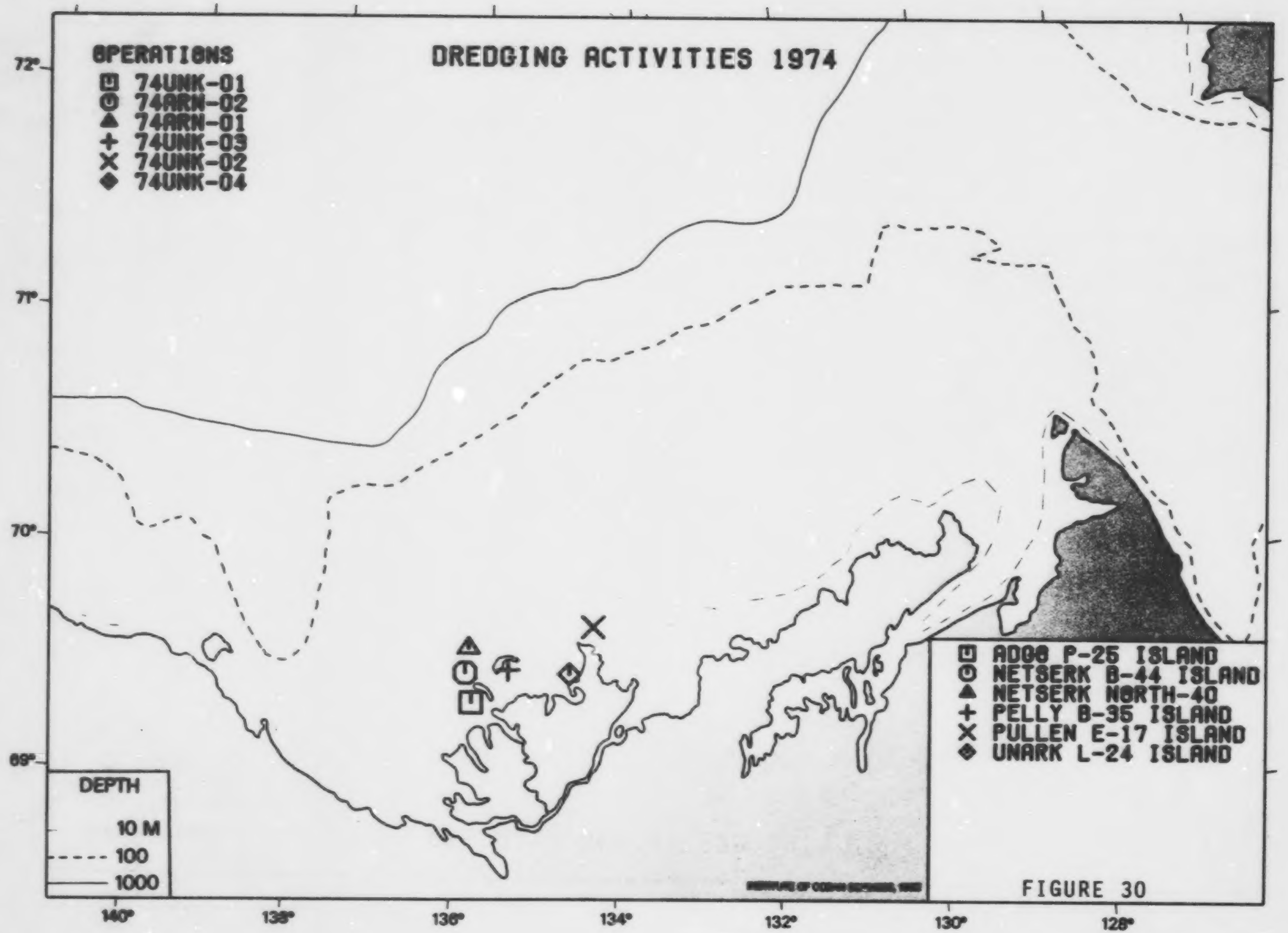

DREDGING ACTIVITIES 1974

FIGURE 30

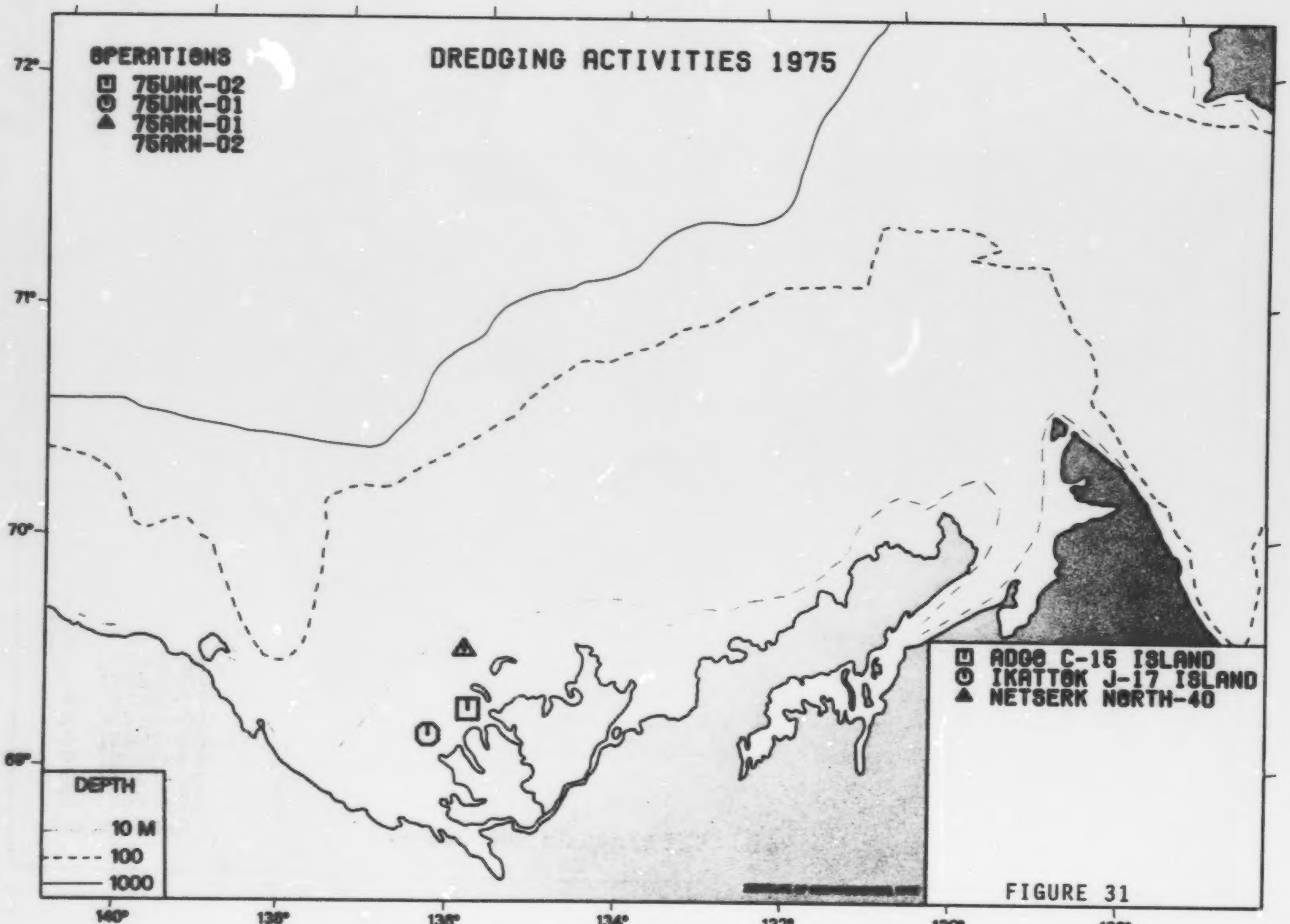

DREDGING ACTIVITIES 1975
OPERATIONS
75UNK-02
75UNK-01
75ARN-01
75ARN-02
ADGO C-15 ISLAND
IKATTOK J-17 ISLAND
NETSERK NORTH-40
DEPTH
10 M
100
1000
72°
71°
70°
69°
140°
138°
136°
134°
132°
130°
128°

FIGURE 31

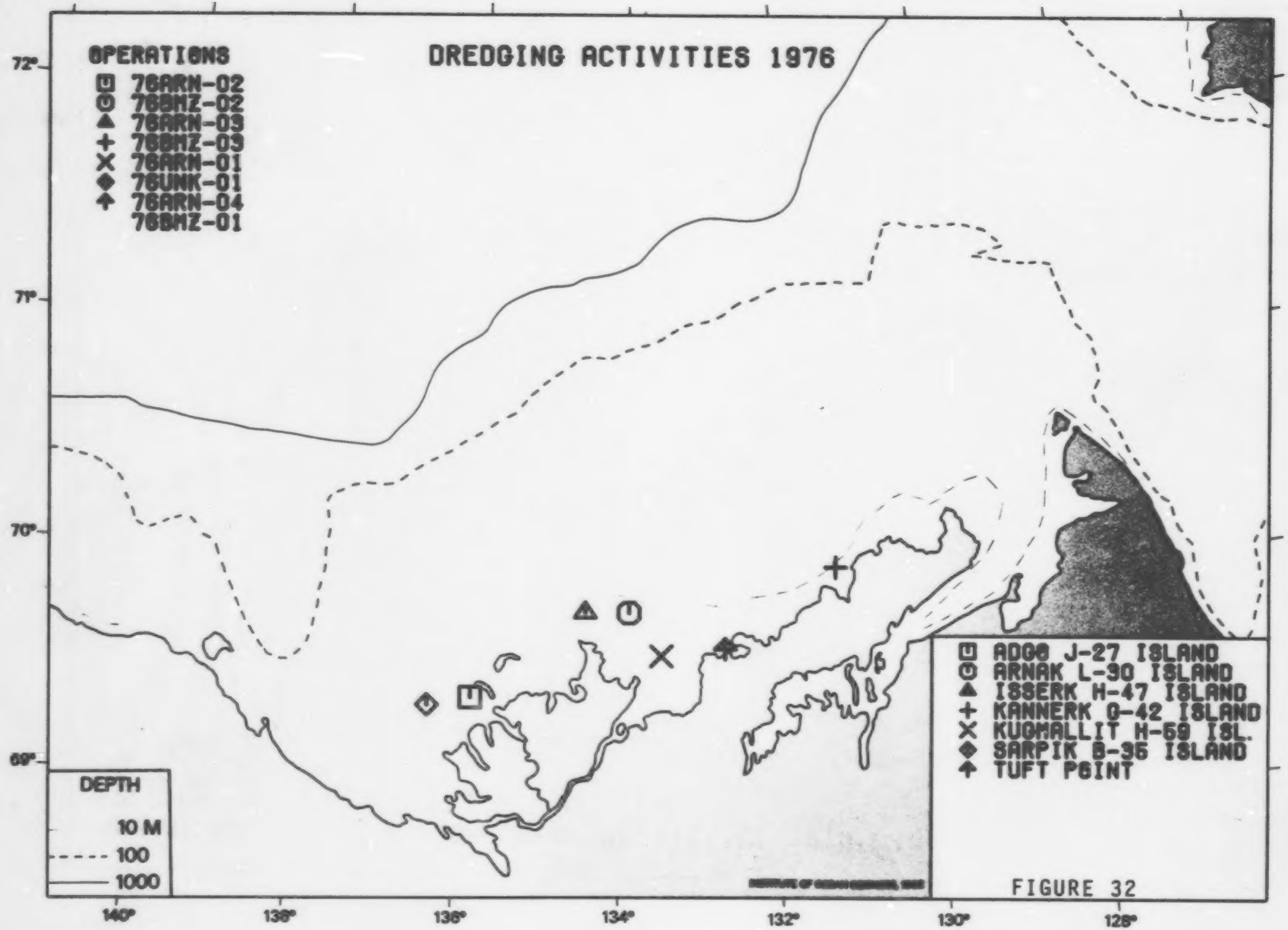
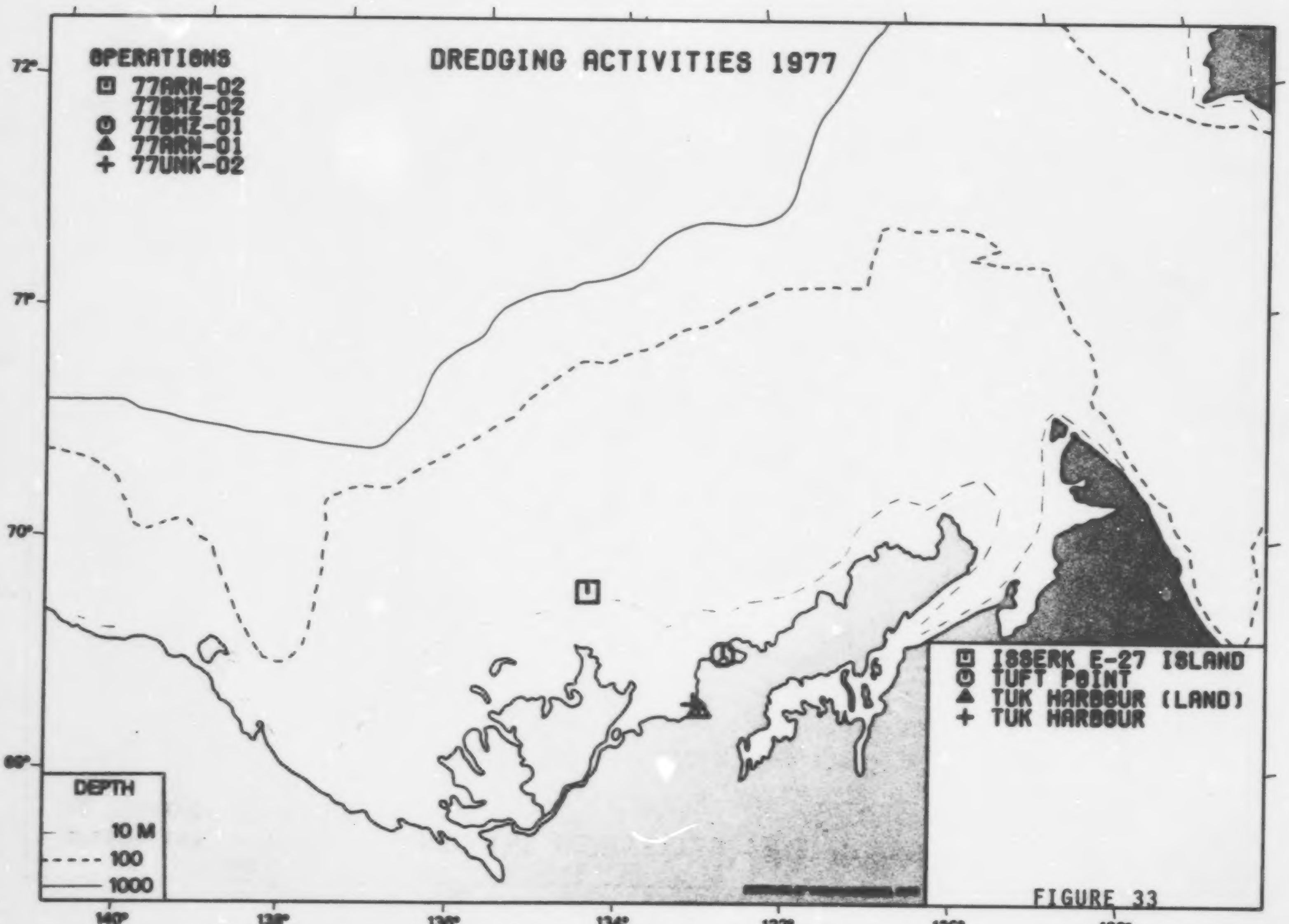
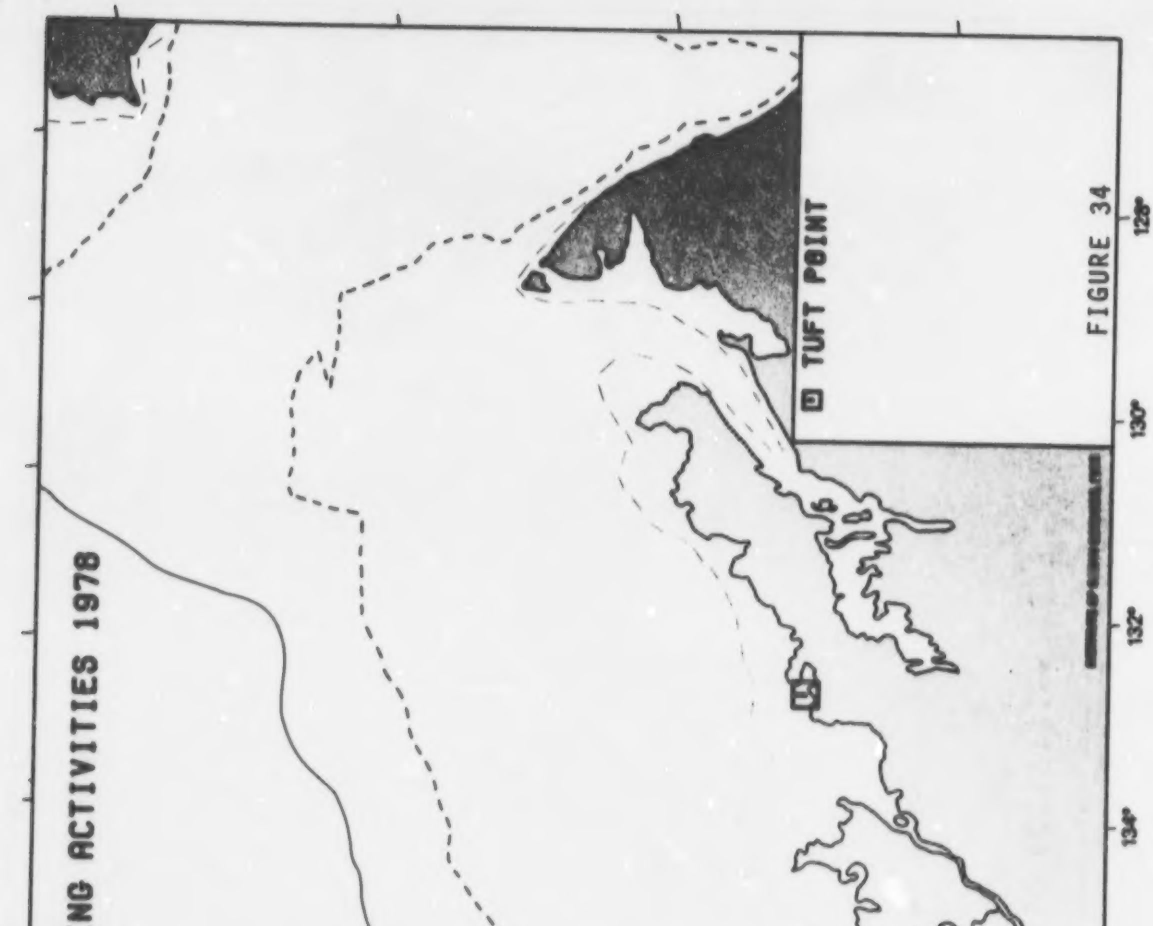

DREDGING ACTIVITIES 1976
OPERATIONS
⊔ 76ARN-02
◯ 76BMZ-02
▲ 76ARN-03
+ 76BMZ-03
✕ 76ARN-01
◆ 76UNK-01
✦ 76ARN-04
76BMZ-01
⊔ ADGO J-27 ISLAND
◯ ARNAK L-30 ISLAND
▲ ISSERK H-47 ISLAND
+ KANNERK G-42 ISLAND
✕ KUGMALLIT H-59 ISL.
◆ SARPIK B-35 ISLAND
✦ TUFT POINT
DEPTH
10 M
100
1000
72°
71°
70°
69°
140°
138°
136°
134°
132°
130°
128°

FIGURE 32



DREDGING ACTIVITIES 1977

FIGURE 33



DREDGING ACTIVITIES 1978

FIGURE 34

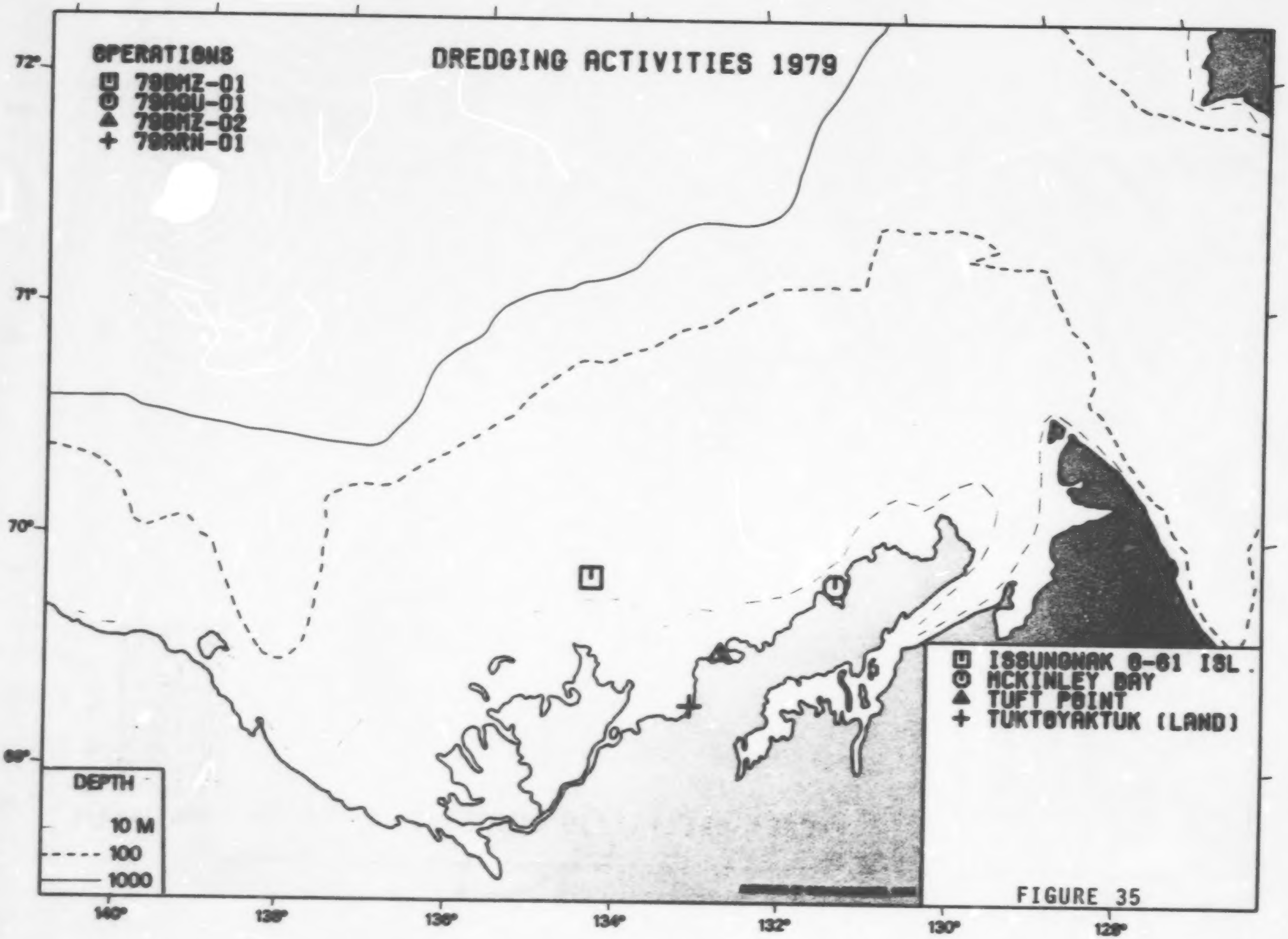

DREDGING ACTIVITIES 1979
OPERATIONS
79BMZ-01
79AGU-01
79BMZ-02
79ARN-01
ISSUNGNAK O-61 ISL.
MCKINLEY BAY
TUFT POINT
TUKTOYAKTUK (LAND)
DEPTH
10 M
100
1000
72°
71°
70°
69°
140°
138°
136°
134°
132°
130°
128°

FIGURE 35

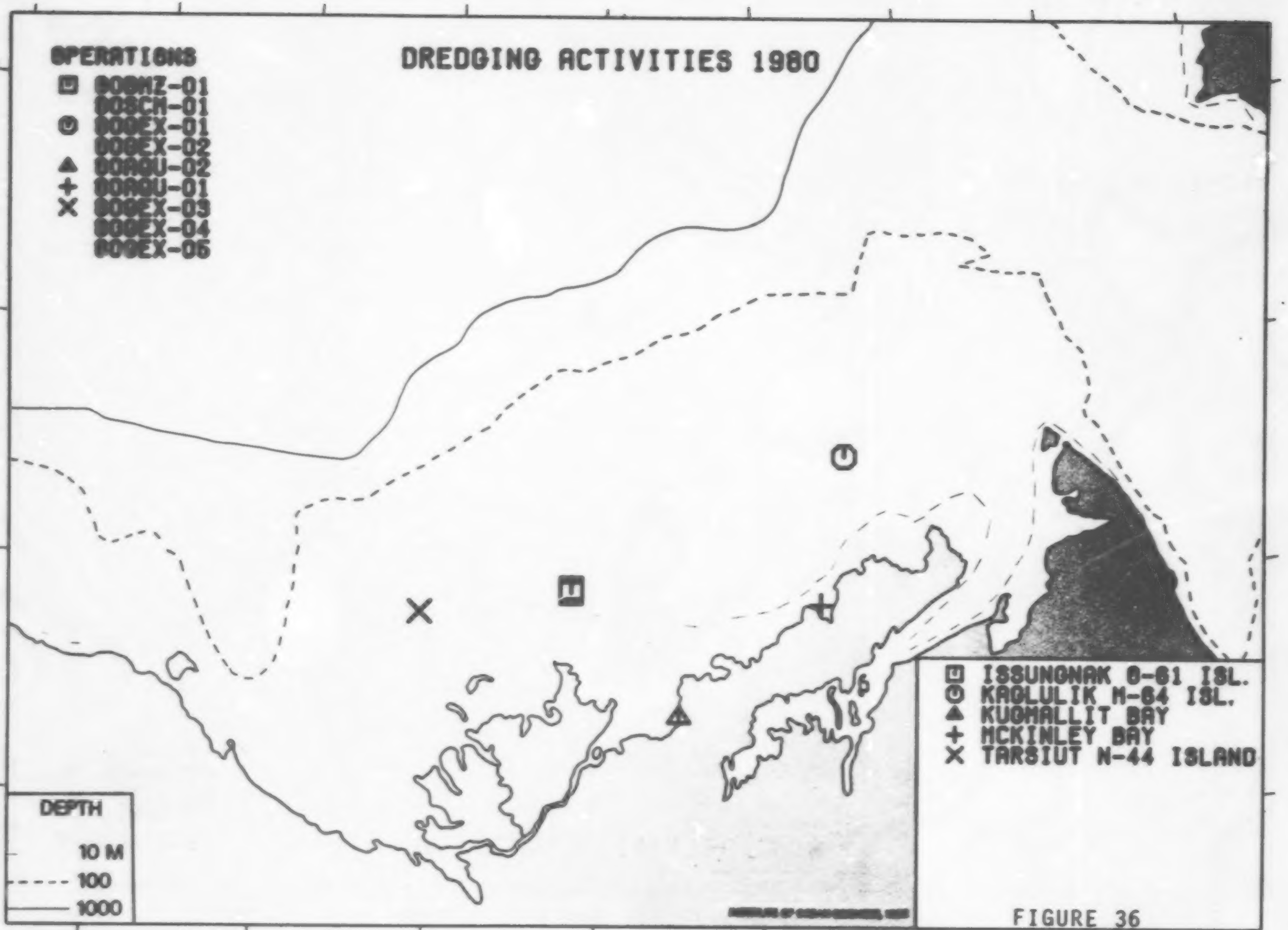

DREDGING ACTIVITIES 1980
OPERATIONS
□ 80BMZ-01
80SCH-01
○ 80GEX-01
80GEX-02
▲ 80AGU-02
+ 80AGU-01
× 80GEX-03
80GEX-04
80GEX-06
□ ISSUNGNAK O-61 ISL.
○ KAGLULIK M-64 ISL.
▲ KUGMALLIT BAY
+ MCKINLEY BAY
× TARSIUT N-44 ISLAND
DEPTH
10 M
100
1000
72°
71°
70°
69°
140°
138°
136°
134°
132°
130°
128°

FIGURE 36

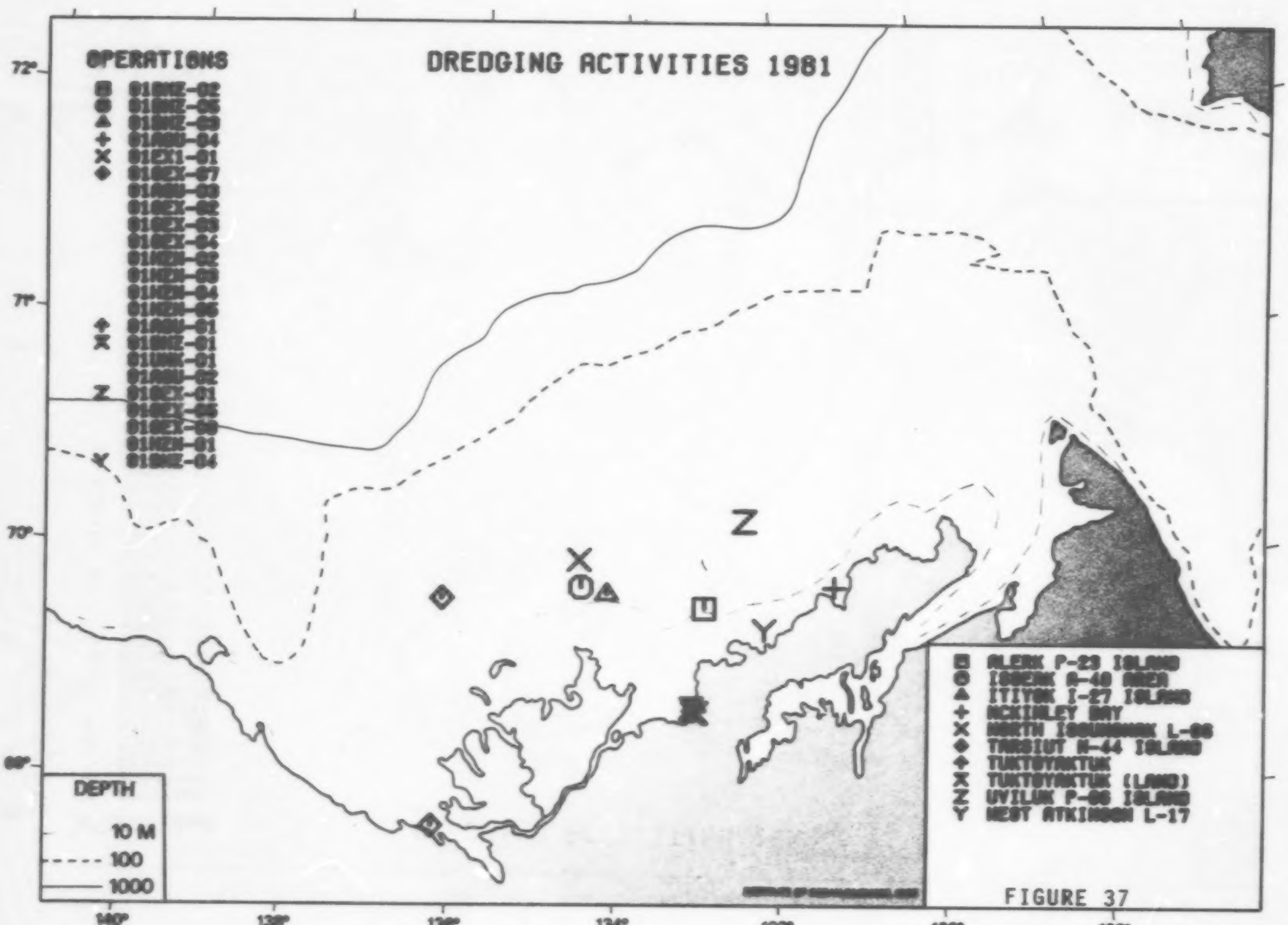

DREDGING ACTIVITIES 1981
OPERATIONS
81DMZ-02
81DMZ-05
81DMZ-03
81AGU-04
81EX1-01
81DEX-07
81AGU-03
81DEX-02
81DEX-03
81DEX-04
81KEN-02
81KEN-03
81KEN-04
81KEN-06
81AGU-01
81DMZ-01
81UNK-01
81AGU-02
81DEX-01
81DEX-05
81DEX-08
81KEN-01
81DMZ-04
ALERK P-23 ISLAND
ISSERK A-40 AREA
ITIYOK I-27 ISLAND
MCKINLEY BAY
NORTH ISSUNGNAK L-86
TARSIUT N-44 ISLAND
TUKTOYAKTUK
TUKTOYAKTUK (LAND)
UVILUK P-66 ISLAND
WEST ATKINSON L-17
DEPTH
10 M
100
1000
72°
71°
70°
69°
140°
138°
136°
134°
132°
130°
128°

FIGURE 37

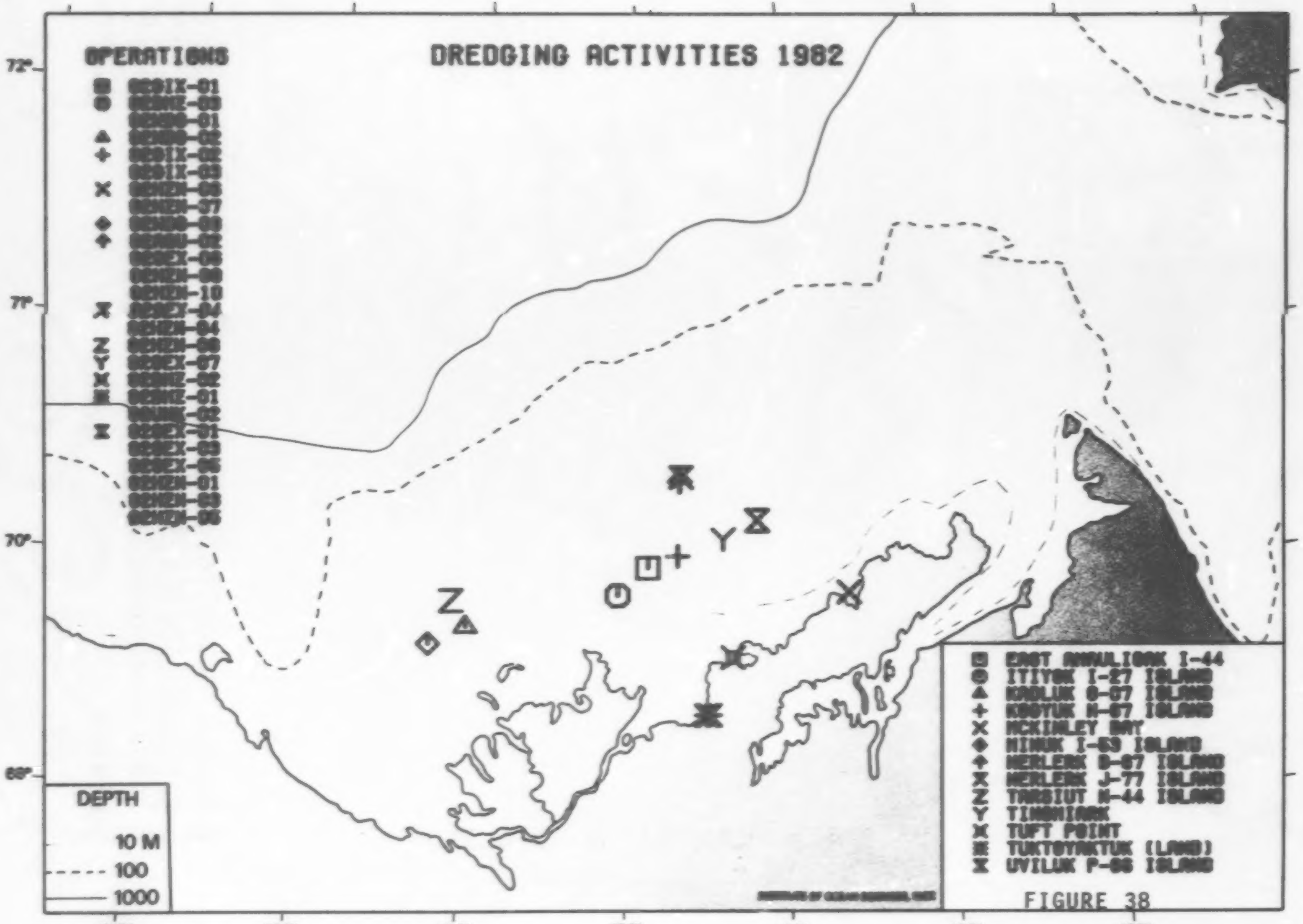

DREDGING ACTIVITIES 1982
OPERATIONS
72°
71°
70°
69°
140°
138°
136°
134°
132°
130°
128°
DEPTH
10 M
100
1000
EAST AMAULIGAK I-44
ITIYOK I-27 ISLAND
KADLUK O-07 ISLAND
KOGYUK N-67 ISLAND
MCKINLEY BAY
MINUK I-53 ISLAND
NERLERK B-67 ISLAND
NERLERK J-77 ISLAND
TARSIUT N-44 ISLAND
TINGMIARK
TUFT POINT
TUKTOYAKTUK (LAND)
UVILUK P-66 ISLAND

FIGURE 38

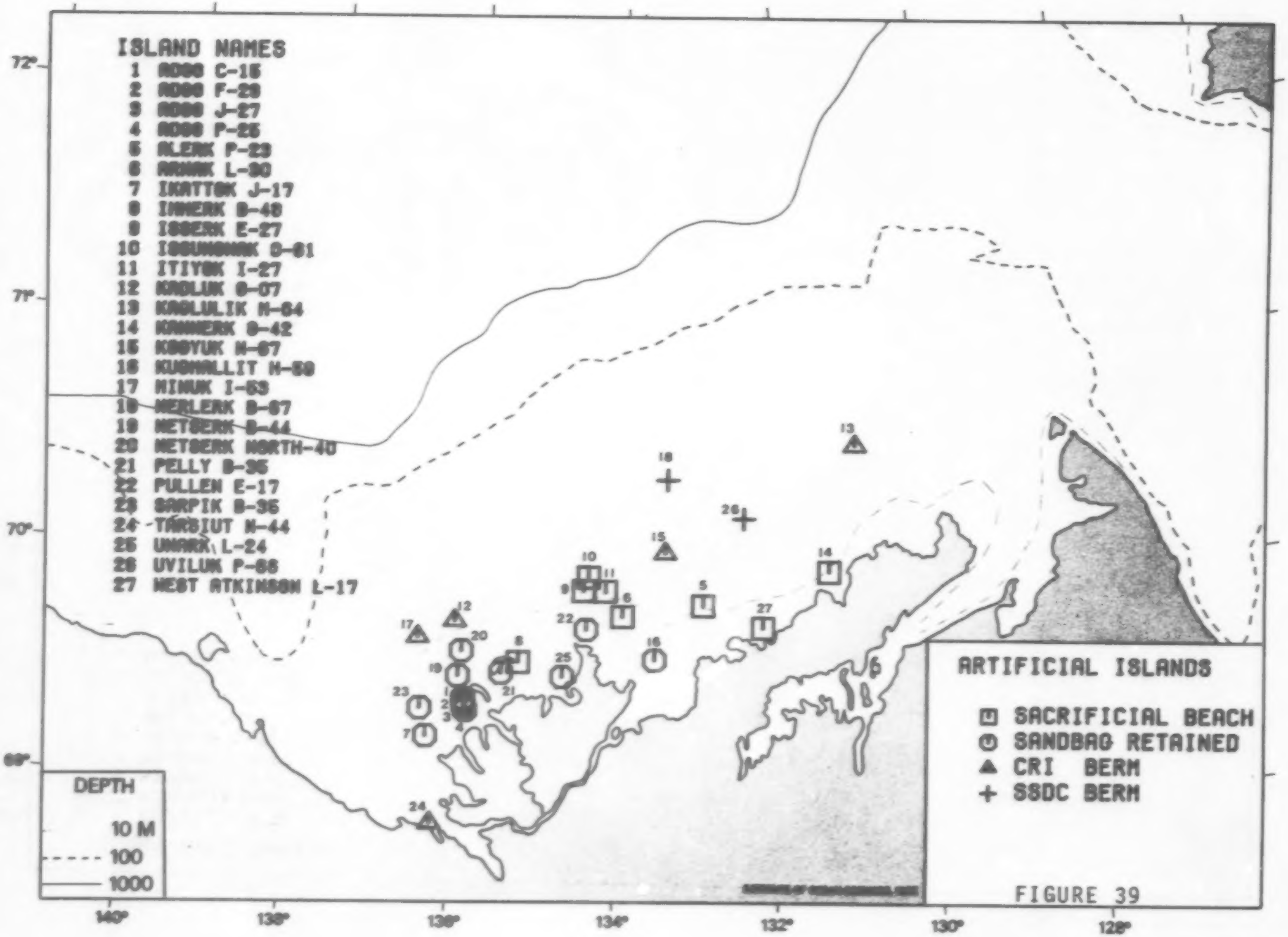

ISLAND NAMES
1 ADGO C-15
2 ADGO F-28
3 ADGO J-27
4 ADGO P-25
5 ALERK P-23
6 ARNAK L-30
7 IKATTOK J-17
8 IMMERK B-48
9 ISSERK E-27
10 ISSUNGNAK O-61
11 ITIYOK I-27
12 KADLUK O-07
13 KAGLULIK M-64
14 KANNERK G-42
15 KOGYUK N-67
16 KUGMALLIT H-59
17 MINUK I-53
18 NERLERK B-67
19 NETSERK B-44
20 NETSERK NORTH-40
21 PELLY B-35
22 PULLEN E-17
23 SARPIK B-35
24 TARSIUT N-44
25 UNARK L-24
26 UVILUK P-66
27 WEST ATKINSON L-17
72°
71°
70°
69°
140°
138°
136°
134°
132°
130°
128°
DEPTH
10 M
100
1000
ARTIFICIAL ISLANDS
SACRIFICIAL BEACH
SANDBAG RETAINED
CRI BERM
SSDC BERM

FIGURE 39

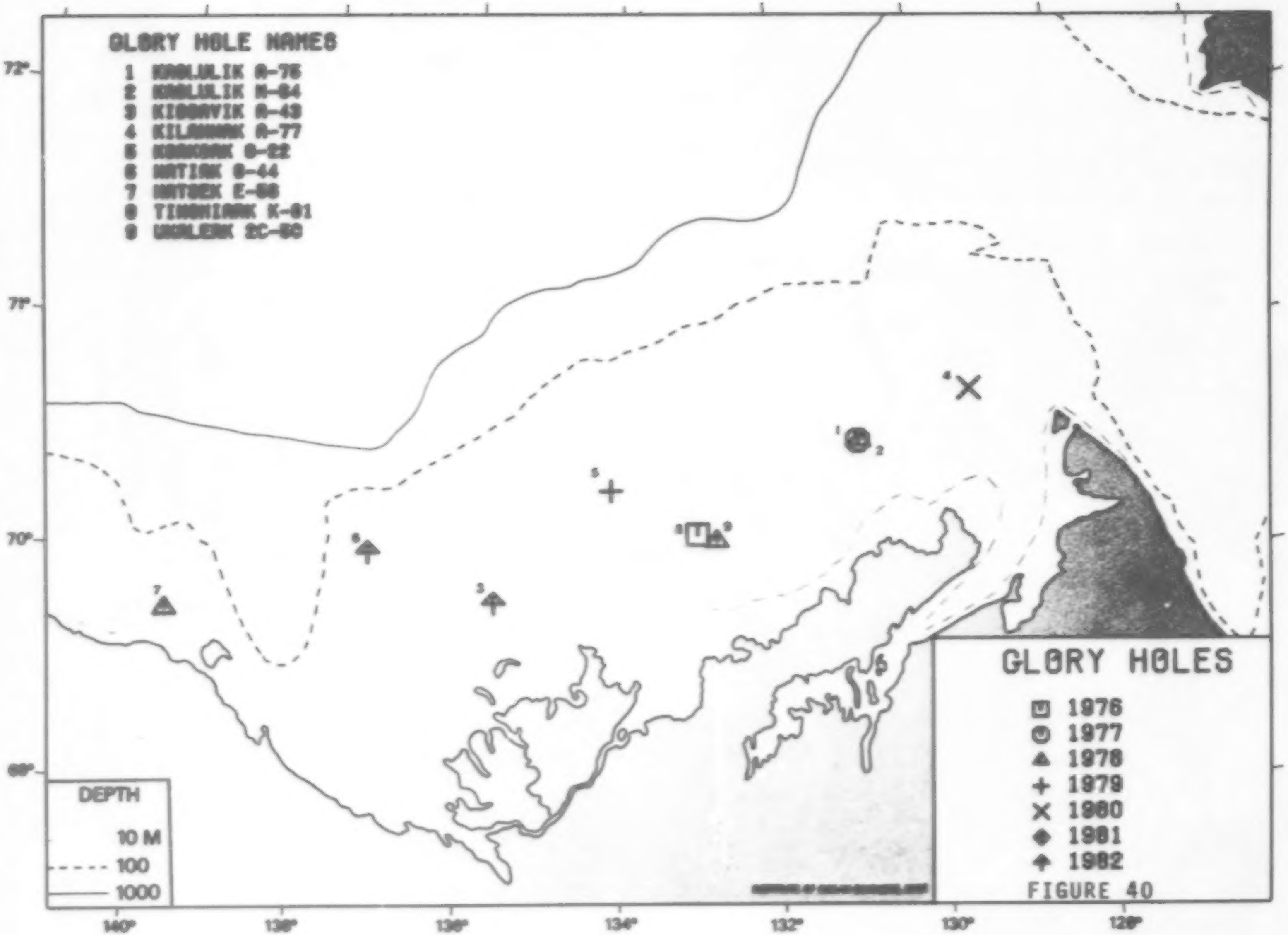
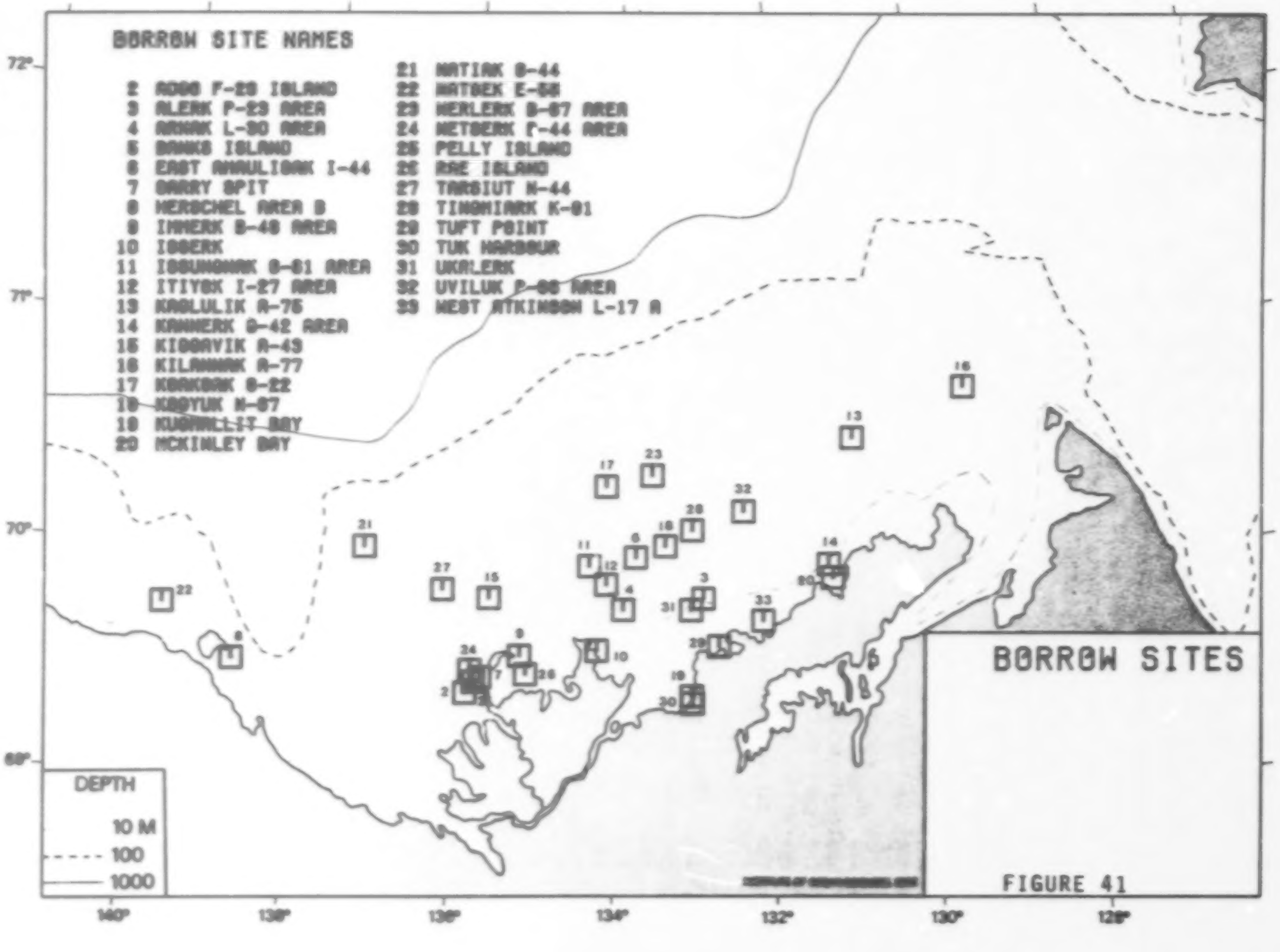

GLORY HOLE NAMES
1 KAGLULIK A-75
2 KAGLULIK M-64
3 KIGGAVIK A-43
4 KILANNAK A-77
5 KOAKOAK O-22
6 NATIAK O-44
7 NATSEK E-56
8 TINGMIARK K-91
9 UKALERK 2C-50
GLORY HOLES
☐ 1976
○ 1977
▲ 1978
+ 1979
× 1980
◆ 1981
✦ 1982
DEPTH
10 M
100
1000
72°
71°
70°
69°
140°
138°
136°
134°
132°
130°
128°
1
2
3
4
5
6
7
8
9

FIGURE 40



BORROW SITES

FIGURE 41

5. RECOMMENDATIONS

1. The past and present regulatory reporting procedures of Beaufort Sea dredging activities proved inadequate to prepare this comprehensive overview of the key operational details such as time, location and quantities. The existing systems of permits/leases/licenses/reports often provides only generalized information about projected dredging requirements, and does not provide accurate performance reports of actual dredging such as specific days of operations, quantities of materials removed including overburdens, losses and so on. At minimum, these industry and government reports must include performance specifics, for each operation, such as purpose, company name, date (day, month, year), type and name of vessel employed, type and volume (including confidence limits) of materials loaded and dumped, load and dump locations (latitude, longitude), and water depth. In addition, for purposes of environmental research, monitoring and impact assessments, the approximate area of substrate removed or covered (m^2 or km^2) should be reported.

2. The historical dredging database should be updated on an annual basis, in order to avoid the problems of locating and searching old files and reports for pertinent details, and to maintain a dependable audit of dredging operations for regulatory, planning and assessment agencies. This updating is the responsibility of the regulatory agencies: DIAND, DOE/EPS and EMR (COGLA). The lead responsibility should be assigned to one department.

3. This historical review of dredging has been archived on a computer database using System 2000 at the Institute of Ocean Sciences. This System 2000 is compatible with the ODCA (Ocean Dumping Control Act) Database in Environment Canada, Ottawa. Possibly the ODCA Database could be expanded to keep information and details on all dredging operations including those not pertaining to the Act's requirements.

4. The computer database concerning dredging should be developed and revised for use on microcomputers (such as Apple) that are commonly available in the north. This industry information and personal sorting capability should be available as a planning and regulatory tool in northern offices of interested government agencies.

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APPENDIX 7.1 Load (L) and Dump (D) site locations.

Dataset ID#		Location	Area	Dataset ID#		Location	Area
59DPW-01	L	69 27 00 132 58 48	Tuk East Channel	73UNK-01	L	69 37 12 135 10 48	Immerk B-48 Area
	D	69 27 00 132 58 48	Tuk East Channel		D	69 27 00 135 51 00	Adgo F-28
60DPW-01	L	69 27 00 132 58 48	Tuk East Channel	73UNK-02	L	69 27 00 135 51 00	Adgo F-28
	D	69 27 00 132 58 48	Tuk East Channel		D	69 27 00 135 51 00	Adgo F-28
61DPW-01	L	69 27 00 133 01 48	Tuk Harbour, Hudson Bay Co. Wharf	74ARN-01	L	69 31 12 135 40 12	Garry Spit
	D	69 27 00 133 01 48	Tuk Harbour, Hudson Bay Co. Wharf		D	69 39 36 135 54 00	Netserk North-40
61DPW-02	L	69 25 48 132 58 12	Tuk Harbour NTCL Camp	74ARN-02	L	69 30 00 135 45 00	Pelly Island
	D	69 25 48 132 57 36	Tuk Harbour NTCL Camp		D	69 33 00 135 55 48	Netserk B-44
61DPW-03	L	69 27 00 132 58 48	Tuk East Channel	74UNK-01	L	69 25 12 135 50 24	Adgo P-25 Area
	D	69 27 00 132 58 48	Tuk East Channel		D	69 25 12 135 50 24	Adgo P-25
72ARN-01	L	69 32 24 135 06 00	Rae Island	74UNK-02	L		Ya Ya Lakes
	D	69 32 24 135 06 00	Rae Island		D	69 46 12 134 19 48	Pullen E-17
72ARN-02	L	69 37 12 135 10 48	Immerk B-48 Area	74UNK-03	L		Ya Ya Lakes
	D	69 37 12 135 10 48	Immerk B-48		D	69 34 12 135 23 24	Pelly B-35
73ARN-01	L	69 37 12 135 10 48	Immerk B-48 Area	74UNK-04	L		Ya Ya Lakes
	D	69 37 12 135 10 48	Immerk B-48		D	69 33 36 134 37 12	Unark L-24
75ARN-01	L	69 30 00 135 45 00	Garry Harbour	76BMZ-02	L	69 49 48 133 52 12	Arnak L-30 Area
	D	69 39 36 135 54 00	Netserk North-40		D	69 49 48 133 52 12	Arnak L-30

APPENDIX 7.1 Load (L) and Dump (D) site locations.
continued

Dataset ID#		Location	Area
75ARN-02	L	69 34 48 135 25 12	Pelly Pit
	D	69 39 36 135 54 00	Netserk North 40
75UNK-01	L		Ya Ya Lakes
	D	69 16 48 136 18 00	Ikattok J-17
75UNK-02	L		Ya Ya Lakes
	D	69 24 00 135 49 12	Adgo C-15
76ARN-01	L	69 40 12 132 39 00	Tuft Point
	D	69 38 24 133 27 36	Kugmallit H-59
76ARN-02	L	69 33 00 135 48 00	Netserk B-44 Area
	D	69 26 24 135 51 00	Adgo J-27
76ARN-03	L	69 49 48 134 25 48	Isserk H-47 Area
	D	69 49 48 134 25 48	Isserk H-47
76ARN-04	L	69 40 12 132 39 00	Tuft Point
	D	69 40 12 132 39 00	Tuft Point
76BMZ-01	L	69 40 12 132 39 00	Tuft Point
	D	69 40 12 132 39 00	Tuft Point
77UNK-01	L	70 09 00 132 44 24	Ukalerk C-50
	D		Tuk Harbour
76BMZ-03	L	70 01 12 131 13 12	Kannerk G-42 Area
	D	70 01 12 131 13 12	Kannerk G-42
76UNK-01	L	69 24 00 135 49 12	Adgo C-15 Area
	D	69 24 00 136 23 24	Sarpik B-35
76UNK-02	L	70 10 48 132 58 48	Tingmiark K-91 (Glory Hole)
	D		
77ARN-01	L		Tuk Harbour
	D	69 25 12 132 57 00	Tuk Harbour (land)
77ARN-02	L	69 40 12 132 39 00	Tuft Point
	D	69 56 24 134 22 12	Isserk E-27
77ARN-03	L	69 40 12 132 39 00	Tuft Point
	D	69 40 12 132 39 00	Tuft Point
77BMZ-01	L	69 40 12 132 39 00	Tuft Point
	D	69 40 12 132 39 00	Tuft Point
77BMZ-02	L	69 56 24 134 22 12	Isserk E-27 Area
	D	69 56 24 134 22 12	Isserk E-27
79BMZ-01	L	69 40 12 132 39 00	Tuft Point
	D	70 00 00 134 18 36	Issungnak O-61

APPENDIX 7.1 Load (L) and Dump (D) site locations.
continued

Dataset ID#		Location	Area	Dataset ID#		Location	Area
77UNK-02	L	69 27 00	Tuk Harbour	79BMZ-02	L	69 40 12	Tuft Point
		133 01 48				132 39 00	
	D	69 27 00	Tuk Harbour		D	69 40 12	Tuft Point
		133 01 48				132 39 00	
77UNK-03	L	70 34 12	Kaglulik A-75	79UNK-01	L	70 22 12	Koakoak 0-22
		130 51 36	(Glory Hole)			134 06 00	(Glory Hole)
	D				D		
78BMZ-01	L	69 40 12	Tuft Point	80AQU-01	L	69 56 24	McKinley Bay
		132 39 00				131 13 12	
	D	69 40 12	Tuft Point		D	69 56 24	McKinley Bay
		132 39 00				131 12 00	
78UNK-01	L	69 45 36	Natsek E-56	80AQU-02	L	69 27 00	Kugmallit Bay
		139 44 24	(Glory Hole)			133 00 00	
	D				D	69 28 12	Kugmallit Bay
						132 58 48	
78UNK-02	L	70 09 00	Ukalerk 2C-50	80BMZ-01	L	70 01 12	Issungnak 0-61 Area
		132 43 48	(Glory Hole)			134 18 36	
	D				D	70 00 00	Issungnak 0-61
						134 18 36	
78UNK-03	L	70 34 12	Kaglulik M-64	80GEX-01	L	70 06 36	Kaglulik South 50
		130 50 24	(Glory Hole)			131 45 00	
	D				D	70 34 12	Kaglulik M-64
						130 50 24	
79AQU-01	L	69 57 36	McKinley Bay	80GEX-02	L		West 17 Borrow
		131 10 12					
	D	69 57 36	McKinley Bay		D	70 34 12	Kaglulik M-64
		131 10 12				130 50 24	
79ARN-01	L	69 27 00	Tuk Harbour, S. of	80GEX-03	L	69 54 00	Tarsiut N-44
		133 01 48	Conn Island			136 11 24	
	D	69 26 24	Tuktoyaktuk (land)		D	69 54 00	Tarsiut N-44
		133 02 24	S. of Pokiak Lake			136 11 24	
80GEX-04	L	69 39 00	Isserk Area	81BMZ-02	L	69 52 48	Alerk P-23 Area
		134 12 00				132 50 24	
	D	69 54 00	Tarsiut N-44		D	69 52 48	Alerk P-23
		136 11 24				132 50 24	

APPENDIX 7.1 Load (L) and Dump (D) site locations.
continued

Dataset ID#		Location	Area	Dataset ID#		Location	Area
80GEX-05	L	69 49 48	Ukalerk	81BMZ-03	L	69 56 24	Itiyok I-27 Area
		133 00 00				134 05 24	
	D	69 54 00	Tarsiut N-44		D	69 56 24	Itiyok I-27
		136 11 24				134 05 24	
80SCM-01	L	70 01 12	Issungnak 0-61 Area	81BMZ-04	L	69 46 48	West Atkinson L-17
		134 18 36				132 04 48	Area
	D	70 01 12	Issungnak 0-61		D	69 46 48	West Atkinson L-17
		134 18 36				132 04 48	
80UNK-01	L	70 46 12	Kilannak A-77	81BMZ-05	L	69 58 12	Isserk A-49 Area
		129 21 00	(Glory Hole)			132 25 12	
	D				D	69 58 12	Isserk A-49 Area
						132 25 12	
81AQU-01	L	69 25 48	Tuk Harbour	81EXI-01	L	70 05 24	North Issungnak
		132 58 48				134 27 00	L-86 (Glory Hole)
	D	69 25 48	Tuk Harbour		D		
		132 58 48					
81AQU-02	L	69 26 24	Tuk Harbour	81GEX-01	L	70 15 36	Uviluk P-66 Area
		133 00 00				132 18 36	
	D	69 26 24	Tuktoyaktuk (land) E.		D	70 15 36	Uviluk P-66
		133 00 36	of Tareoknitok Lake			132 18 36	
81AQU-03	L		South Tarsiut Borrow	81GEX-02	L		South Tarsiut
	D	69 54 00	Tarsiut N-44		D	69 54 00	Tarsiut N-44
		136 11 24				136 11 24	
81AQU-04	L	69 56 24	McKinley Bay	81GEX-03	L	69 32 24	Herschel Area B
		131 13 12				138 48 00	
	D	69 57 36	McKinley Bay North		D	69 54 00	Tarsiut N-44
		131 10 12	Protection Island			136 11 24	
81BMZ-01	L	69 25 12	Tuk Harbour	81GEX-04	L	69 49 48	Ukalerk
		132 57 36				133 00 00	
	D	69 25 12	Tuk Harbour (Land)		D	69 54 00	Tarsiut N-44
		132 57 00				136 11 24	
81GEX-05	L	69 49 48	Ukalerk	82AQU-01	L	69 52 12	Kiggavik A-43
		133 00 00				135 35 24	(Glory Hole)
	D	70 15 36	Uviluk P-66		D		
		132 18 36					

APPENDIX 7.1 Load (L) and Dump (D) site locations.
continued

Dataset ID#		Location	Area	Dataset ID#		Location	Area
81GEX-06	L		South Tarsiut	82AQU-02	L	70 25 12 133 30 00	Nerlerk B-67 Area
	D	70 15 36 132 18 36	Uviluk P-66		D	70 25 48 133 18 00	Nerlerk B-67
82GEX-07	L	69 49 48 133 00 00	Ukalerk	82BMZ-01	L	69 25 12 132 57 36	Tuk Harbour
	D	69 54 00 136 11 24	Tarsiut N-44, North Spur		D	69 25 12 132 57 00	Tuk Harbour (land)
81HZN-01	L	69 49 48 133 00 00	Ukalerk	82BMZ-02	L	69 40 12 132 39 00	Tuft Point
	D	70 15 36 132 18 36	Uviluk P-66		D	69 40 12 132 39 00	Tuft Point
81HZN-02	L		South Tarsiut	82BMZ-03	L	69 56 24 134 05 24	Itiyok I-27 Area
	D	69 54 00 136 11 24	Tarsiut N-44		D	69 56 24 134 05 24	Itiyok I-27
81HZN-03	L	69 49 48 133 00 00	Ukalerk	82GEX-01	L	70 06 36 131 45 00	Kaglulik South 50
	D	69 54 00 136 11 24	Tarsiut N-44		D	70 15 36 132 18 36	Uviluk P-66
81HZN-04	L	69 32 24 138 48 00	Herschel Area B	82GEX-02	L	70 20 24 133 19 48	Nerlerk Area
	D	69 54 00 136 11 24	Tarsiut N-44		D		Nerlerk F-67
81HZN-05	L	69 39 00 134 12 00	Isserk	82GEX-03	L	69 49 48 133 00 00	Ukalerk
	D	69 54 00 136 11 24	Tarsiut N-44		D	70 15 36 132 18 36	Uviluk P-66
81UNK-01	L	69 25 12 132 59 24	Tuk Harbour	82GEX-04	L	69 49 48 133 00 00	Ukalerk
	D	69 25 12 132 59 24	Tuk Harbour (land)		D	70 27 00 133 16 48	Nerlerk J-77
82GEX-05	L	71 30 00 123 34 48	Banks Island	82HZN-04	L	69 49 48 133 00 00	Ukalerk
	D	70 15 36 132 18 36	Uviluk P-66		D	70 27 00 133 16 48	Nerlerk J-77

APPENDIX 7.1 Load (L) and Dump (D) site locations.
continued

Dataset ID#		Location	Area	Dataset ID#		Location	Area
82GEX-06	L	69 49 48 133 00 00	Ukalerk	82HZN-05	L		South Tarsiut
	D	70 25 48 133 18 00	Nerlerk B-67		D	70 15 36 132 18 36	Uviluk P-66
82GEX-07	L	70 10 48 70 45 00	Tingmiark	82HZN-06	L	69 49 48 133 00 00	Ukalerk
	D	70 10 48 70 45 00	Tingmiark		D	69 56 24 131 10 12	McKinley Bay
82GIX-01	L	70 03 36 133 42 36	East Amauligak I-44 (Glory Hole)	82HZN-07	L	70 06 36 131 45 00	Kaglulik South 50
	D				D	69 56 24 131 10 12	McKinley Bay
82GIX-02	L	70 06 36 133 19 48	Kogyuk N-67	82HZN-08	L	69 49 48 133 00 00	Ukalerk
	D	69 59 24 133 03 36	Kogyuk N-67 Area		D	69 54 00 136 11 24	Tarsiut N-44
82GIX-03	L	69 49 48 133 00 00	Ukalerk	82HZN-09	L	69 49 48 133 00 00	Ukalerk
	D	70 06 36 133 19 48	Kogyuk N-67		D	70 25 48 133 18 00	Nerlerk B-67
82HZN-01	L	70 06 36 131 45 00	Kaglulik South 50	82HZN-10	L	69 49 48 133 00 00	Ukalerk
	D	70 15 36 132 18 36	Uviluk P-66		D	70 25 48 133 18 00	Nerlerk B-67
82HZN-02	L	70 15 00 133 22 12	Nerlerk Ridge	82UNK-01	L	70 04 12 137 13 12	Natiak 0-44 (Glory Hole)
	D		Nerlerk F-67		D		
82HZN-03	L	69 49 48 133 00 00	Ukalerk	82UNK-02	L	69 25 12 132 59 24	Tuk Harbour
	D	70 15 36 132 18 36	Uviluk P-66		D	69 25 12 132 59 24	Tuk Harbour (land)

APPENDIX 7.1 Load (L) and Dump (D) site locations.
continued

Dataset ID#		Location	Area
82WDG-01	L	69 49 48 133 00 00	Ukalerk
	D	69 56 24 134 05 24	Itiyok I-27
82WDG-02	L	69 49 48 133 00 00	Ukalerk
	D	69 47 24 136 00 00	Kadluk O-07
82WDG-03	L	69 49 48 133 00 00	Ukalerk
	D	69 42 36 136 27 36	Minuk I-53

APPENDIX 7.2. Existing legislation applicable to Beaufort Sea dredging.

A. Territorial Lands Act (TLA)

(first passed in 1952, latest amendments made in March 1970; administered by Department of Indian Affairs and Northern Development)

This Act oversees the disposition, administration and management of all Territorial Lands. In the Northwest Territories (N.W.T.), these lands are defined in the Northwest Territories Act and do not include offshore lands (e.g. sea bed). Occupation of land is regulated under a system of leases and licenses, referred to as a land tenure agreement. Activities carried out on unleased land are regulated under the Territorial Land Use Regulations (first passed in 1971 and amended in 1977 to include the Eastern Arctic). Land use activities are controlled under a system of land-use permits which authorize and individual or company to carry out a specific land-use operation at a specified place, during a specified period of time and subject to specific terms and conditions including provisions to allow for adequate protection of the affected environment. Because offshore lands do not fall under the jurisdiction of the Northwest Territories Act and the Territorial Lands Act, the associated Territorial Land Use Regulations do not apply to Beaufort Sea dredging.

B. Public Lands Grant Act (PLGA)

(first passed in 1952; latest amendments made in 1982; administered by Department of Indian Affairs and Northern Development)

The Public Lands Grant Act is responsible for the disposition of Crown lands anywhere in Canada which is not already provided for in other legislation. The PGLA has been used in the Northwest Territories to regulate allocation of offshore lands such as the Beaufort Sea sea bed.

Dredging is regulated under the Public Lands Grant Act and the associated Public Lands Leasing and Licensing Regulations by:

(a) requiring that proponents obtain a PLGA lease to "occupy" subsea "lands". The lease includes convenants that define which activities the proponent may carry out on the leased lands (i.e. construction of an island) and outlines environmental terms and conditions to be applied to that particular activity at that site. Enforcement is based upon assuring that the proponent meets the covenant of the lease. Should the proponent not meet these covenants, the company would essentially be in breech of its "contract" with the federal government to meet the conditions of that lease. DIAND could then revoke the lease which would legally mean that, if the proponent continued to carry out activities at that site, he would be doing so without legally occupying the land (i.e. he would be trespassing) and would be charged. This type of regulatory regime (i.e. leases) is usually used for the construction of artificial islands.

(b) DIAND also issues "licenses" under the PLGA. These apply to situations where a proponent may be permitted to occupy land for

APPENDIX 7.2. Existing legislation applicable to Beaufort Sea dredging. continued

reasons other than to build something and where more than one proponent might be involved. An example of a situation where a licence might be used for regulating dredging could be where several companies share a dredging area for granular material.

C. Navigable Waters Protection Act (NWPA)
(first passed in 1882; administered by Transport Canada, Canadian Coast Guard, Navigable Waters Protection Service)

Any dumping of fill or excavation of materials from the bed of a navigable water or construction of any "work" in a navigable water must be approved under the NWPA. This approval is necessary for all dredging or construction-related dredging which occurs in "navigable waters". When a proposal to dredge is made, it is reviewed by Transport Canada and distributed to selected reviewers (including EPS) to assess its potential for interferring with navigation interests. Comments are solicited and are expected to be limited to navigation concerns. Interested agencies may pursue environmental concerns under their own respective mandates.

D. Ocean Dumping Control Act (ODCA)
(passed in 1975; administered by Environment Canada, Environmental Protection Service)

The Ocean Dumping Control Act regulates the disposal of dredge spoil. The ODCA does not apply to material dredged for the purposes of construction, such as the building of artificial islands or land reclamation projects.

Permits are required for all projects where disposal of dredged material is involved, except where the dredging is "incidental" to the exploration for sea bed mineral resources, or the volume of material dumped is judged to be inconsequential or "de minimus". In general, a volume of less than 1,000 cubic metres of dredged material is regarded "de minimus" (Environmental Protection Service Interpretation Package). Thus dredging for glory-holes could be exempted through either of the above criteria, depending upon the size of the hole.

To date, ODCA permits have generally covered two types of dumping in the Beaufort Sea :

(a) side-cast dredging of material during access channel dredging or of material unsuitable for artificial island construction;
(b) suction-hopper dredge disposal of material unsuitable for artificial island construction at a defined dumpsite.

Environmental controls are written into the terms and conditions of the permit. These controls generally specify that an inspector be on-site during dumping and that monitoring of dumping activity and dumped material be carried out. The controls may place restrictions on where and when dumping takes place.

APPENDIX 7.3. Canadian dredging levels on a regional basis.

ATLANTIC

Dredging of small fishing harbours is an important component of dredging in the Atlantic provinces. While the quantity of material dredged in each harbour is relatively small (approximately 20,000 to 50,000 cubic metres), the number of harbours is large and many harbours require annual dredging due to sediment disposition patterns in either the harbours themselves or the entrance channels. Major dredging of commercial harbours occurs mainly in New Brunswick, with the St. John Harbour being the largest maintenance project.

QUEBEC

Large scale dredging projects take place in the St. Lawrence River. These projects are regulated by provincial legislation and by the Federal Environmental Assessment And Review Process. Major areas of dredging have included Quebec City, Trois-Rivieres, Gentilly, Sorel and Beauharnois.

ONTARIO

Most of the dredging activity has been undertaken in the Great Lakes. This activity has been divided among projects in Lakes Ontario, Erie and Superior.

PACIFIC

The Pacific region is responsible for 55% of the total dredging by the Department of Public Works for all of Canada. Much of this dredging can be explained by the great effort which is needed to dredge large quantities of sand and gravel from the Fraser River.

NORTHERN AND WESTERN

The majority of large scale dredging has been conducted privately for construction of artificial islands as oil-drilling platforms in the Beaufort Sea. In terms of quantity, these projects have been some of the largest in Canada.

SUMMARY

Large volumes of material are being dredged by private firms in the Pacific and Arctic regions, whereas much of the dredging in the Great Lakes and the Atlantic region is carried out for and/or by government agencies.

APPENDIX 7.4. Major international dredging activities and dredged material volumes.

Region	Maintenance * (m^3)	Construction **(m^3)	Total	% Total
Northern Europe	5 467 700	12 353 300	17 821 000	21
Mediterranean	2 000	2 247 400	2 249 400	3
Africa	9 998 200	9 494 900	19 493 200	24
Southern Asia	3 176 700	18 587 100	21 763 800	27
Southeast Asia	1 335 800	343 500	1 679 400	2
East Asia	492 300	10 576 500	11 068 800	14
South Pacific	541 100	3 709 900	4 251 000	5
North America	2 082 100	1 042 800	3 125 000	4
Caribbean	48 900	253 100	302 000	0.003
	23 144 800	58 608 400	81 753 600	100%

*Maintenance Volumes for 1979
**Construction Volumes for 1975 to 1979

(Source: MacLaren Plansearch, 1982.)

Volume

2

ARCTIC INDUSTRIAL ACTIVITIES COMPILATION
VOLUME 2
Sverdrup Basin: Hydrocarbon Exploration 1974 to 1984

T. Sackmann and B.D. Smiley

Institute of Ocean Sciences
Department of Fisheries and Oceans
Sidney, B.C. V8L 4B2

1985

CANADIAN DATA REPORT OF HYDROGRAPHY AND OCEAN SCIENCES
NO. 32

Canadian Data Report Of Hydrography and Ocean Sciences

Data reports provide a medium for the documentation and dissemination of data in a form directly useable by the scientific and engineering communities. Generally, the reports contain raw and/or analyzed data but will not contain interpretations of the data. Such compilations commonly will have been prepared in support of work related to the programs and interests of the Ocean Science and Surveys (OSS) sector of the Department of Fisheries and Oceans.

Data reports are not intended for general distribution and the contents must not be referred to in other publications without prior written authorization from the issuing establishment. The correct citation appears above the abstract of each report. Data reports are abstracted in *Aquatic Sciences and Fisheries Abstracts* and indexed in the Department's annual index to scientific and technical publications.

Data reports are produced regionally but are numbered nationally. Requests for individual reports will be filled by the issuing establishment listed on the front cover and title page. Out of stock reports will be supplied for a fee by commercial agents.

Regional and headquarters establishments of Ocean Science and Surveys ceased publication of their various report series as of December 1981. A complete listing of these publications is published in the *Canadian Journal of Fisheries and Aquatic Sciences*, Volume 39: Index to Publications 1982. The current series, which begins with report number 1, was initiated in January 1982.

Rapport statistique canadien sur l'hydrographie et les sciences océaniques

Les rapports statistiques servent de véhicule pour la compilation et la diffusion des données sous une forme directement utilisable par les scientifiques et les techniciens. En général, les rapports contiennent des données brutes ou analysées, mais ne fournissent pas d'interprétation des données. Ces compilations sont préparées le plus souvent à l'appui de travaux liés aux programmes et intérêts du service des Sciences et levés océaniques (SLO) du ministère des Pêches et des Océans.

Les rapports statistiques ne sont pas destinés à une vaste distribution et leur contenu ne doit pas être mentionné dans une publication sans une autorisation écrite préalable de l'établissement auteur. Le titre exact paraît au-dessus du résumé de chaque rapport. Les rapports statistiques sont résumés dans la revue *Résumés des sciences halieutiques et aquatiques*, et ils sont classés dans l'index annuel des publications scientifiques et techniques du Ministère.

Les rapports statistiques sont produits à l'échelon régional, mais numérotés à l'échelon national. Les demandes de rapports seront satisfaites par l'établissement auteur dont le nom figure sur la couverture et la page du titre. Les rapports épuisés sont fournis contre rétribution par des agents commerciaux.

Les établissements des Sciences et levés océaniques dans les régions et à l'administration centrale ont cessé de publier leurs diverses séries de rapports en décembre 1981. Une liste complète de ces publications figure dans le volume 39, Index des publications 1982, du *Journal canadien des sciences halieutiques et aquatiques*. La série actuelle a commencé avec la publication du rapport numéro 1 en janvier 1982.

CANADIAN DATA REPORT OF
HYDROGRAPHY AND OCEAN SCIENCES
NO. 32

1985

ARCTIC INDUSTRIAL ACTIVITIES COMPILATION

VOLUME 2

SVERDRUP BASIN: HYDROCARBON EXPLORATION 1974 TO 1984

by

T. Sackmann and B. D. Smiley

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ABSTRACT

Sackmann, T. and B. D. Smiley, 1985. Arctic Industrial Activities Compilation: Volume 2; Sverdrup Basin: Hydrocarbon Exploration 1974 to 1984. Can. Data Rep. Hydrogr. Ocean Sci. 32: (Vol. 2) 181p.

This volume is one of a group of catalogues designed to compile and summarize important descriptive details of selected industrial activities carried out in the offshore Canadian Arctic during the past two or three decades. For user convenience, the Arctic has been arbitrarily divided into seven geographical areas, incorporating where possible, major oceanographic regions. These seven areas coincide with those of a companion series, namely, the Arctic Data Compilation and Appraisal catalogues which describe historic oceanographic data (currents, hydrocarbons, whales -- to mention a few). The approach and format within and between these catalogues and series are intended to facilitate comparison among subjects and regions.

With such a large undertaking, it is not possible to provide all catalogues at once. Therefore, publications which are presently available in the series are indicated on the inside back cover of each volume.

Marine industrial development is ongoing, and further updates of these catalogue descriptions are planned. Readers are requested to submit corrections and additions by writing to the issuing establishment. Such revision will be incorporated into an interactive computer graphics and listing system, and custom reports and maps will be available upon request.

Key words: Canadian Arctic, marine industrial activities, catalogue, database.

RÉSUMÉ

Sackmann, T. and B. D. Smiley, 1985. Arctic Industrial Activities Compilation: Volume 2; Sverdrup Basin: Hydrocarbon Exploration 1974 to 1984. Can. Data Rep. Hydrogr. Ocean Sci. 32: (Vol. 2) 181p.

Le présent volume fait partie d'une série de répertoires conçus pour la compilation et le résumé des importants détails descriptifs d'activités industrielles choisies effectuees dans les eaux hauturières canadiennes de l'Arctique au cours des deux ou trois dernières décennies. Pour faciliter l'utilisation de l'ouvrage, les auteurs ont divisé arbitrairement l'Arctique en sept zones géographiques incorporant, si possible, de grandes régions océanographiques. Ces sept zones coïncident avec celles d'une série associée, les Arctic Data Compilation and Appraisal catalogues, qui décrit les données océanographiques historiques (courants, hydrocarbures, baleines, etc.). L'approche et la présentation de ces répertoires et séries visent une comparaison facile entre les sujets et les régions.

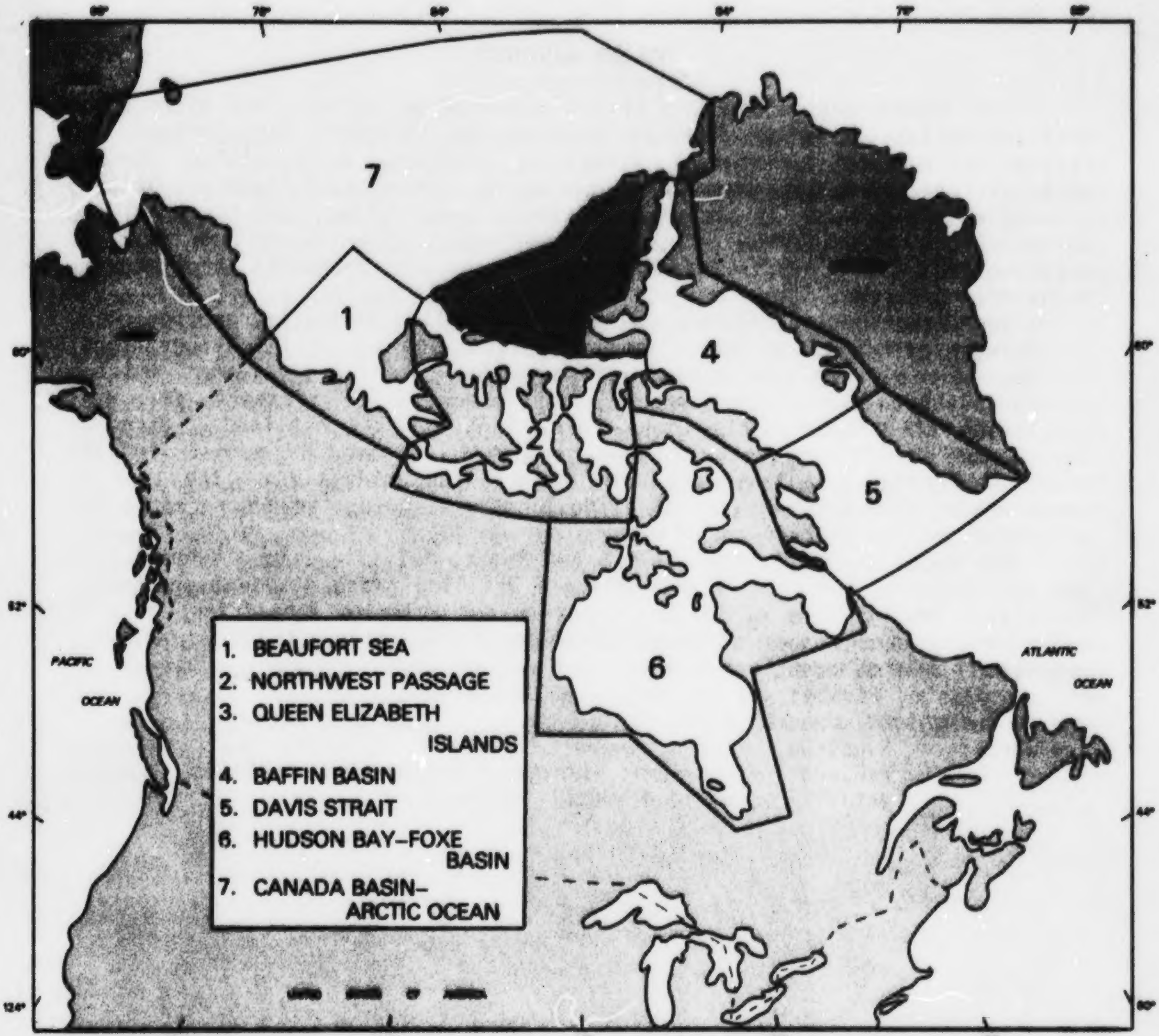
Il n'est pas possible de fournir tous les répertoires en même temps dans un

RÉSUMÉ
continued

travail de telle envergure. Les ouvrages de la série actuellement disponibles sont donc indiqués au plat du verso de chaque volume.

Le développement industriel du milieu marin est une activité permanente; on prévoit donc des mises à jour des répertoires. On demande aux lecteurs de faire parvenir leurs corrections et ajouts à l'établissement d'où provient la publication. De telles révisions seront ajoutées à un système interactif de listage et de traitement des données graphiques, des cartes et des rapports spéciaux seront disponibles sur demande.

Mots-clés: Arctique canadien, activités industrielles en milieu marin, répertoire, base de données.



This map shows the approximate study area covered by this volume, shown in relationship to other arbitrary areas in other volumes of this series, and also of the companion series, the Arctic Data Compilation and Appraisal catalogues for historic oceanographic measurements.

VOLUME ABSTRACT

This report presents a historical overview of seismic and hydrocarbon drilling activities in the Sverdrup Basin Region, NorthWest Territories. The review of seismic exploration activities includes a discussion of the vehicles, energy sources used in seismic surveys, timing of field operations, an outline of operator involvement in seismic exploration, and the areal and chronological distribution of these activities. The discussion text is supplemented with computer-drawn maps of seismic transects shot during individual programs.

Hydrocarbon exploration and delineation drilling activities are reviewed, including a discussion of the timing of well starts and drilling operations, rig movement and wellsite access, offshore ice drilling platforms, and the subsea blowout prevention system. An experimental offshore gas well completion at the Panarctic Drake Point F-76 well is outlined. Operator involvement in drilling activities is discussed, followed by a review of the areal and chronological distribution of drilling activities. The text is supplemented with maps showing drilling locations segregated according to the proponent and the year of operation.

The layout and activities at the Rea Point, Melville Island support base are reviewed, as are onshore and offshore drilling fluid disposal practices. Individual descriptions of seismic programs and wellsite activities, as well as tradenames and usages of common drilling fluid components and additives, are listed in the appendices.

Key words: Sverdrup Basin, Queen Elizabeth Islands, oil and gas exploration, seismic surveys, exploratory drilling, support activities, waste disposal, database.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the information and assistance given during the research and preparation of this report. We are particularly indebted to Warren Fenton of the Environmental Protection Service, Yellowknife for provision of field support during the search phase and his generous assistance and advice in accessing pertinent files and reports. Thanks are due to Floyd Adlem of Indian and Northern Affairs Canada (INAC) and Maurice Thomas of Canada Oil and Gas Lands Administration (COGLA) for their assistance in accessing agency files and maps. Lindsay Franklin and Bill Singletary of Panarctic Oils Limited, Calgary, Jim Hunder of Seiscom Delta United, Calgary, and S. Siegfried of Sonics Exploration Limited, Calgary were generous in providing details of company activities. We are grateful to Ildy Szabo for production of the base maps for this report and to Coralie Wallace of C.A. Graphics for the preparation of the figures and drawings. Special thanks must be given to George Floyd and Susan Ball for design of the database and production of the computer-drawn maps. The authors are obliged to Sharon Thomson and Ron Perkin of IOS for their editing and review of the manuscript. Finally, the typing services of Avril Peters, Judy Pitcher, and Irene Sipila are sincerely appreciated.

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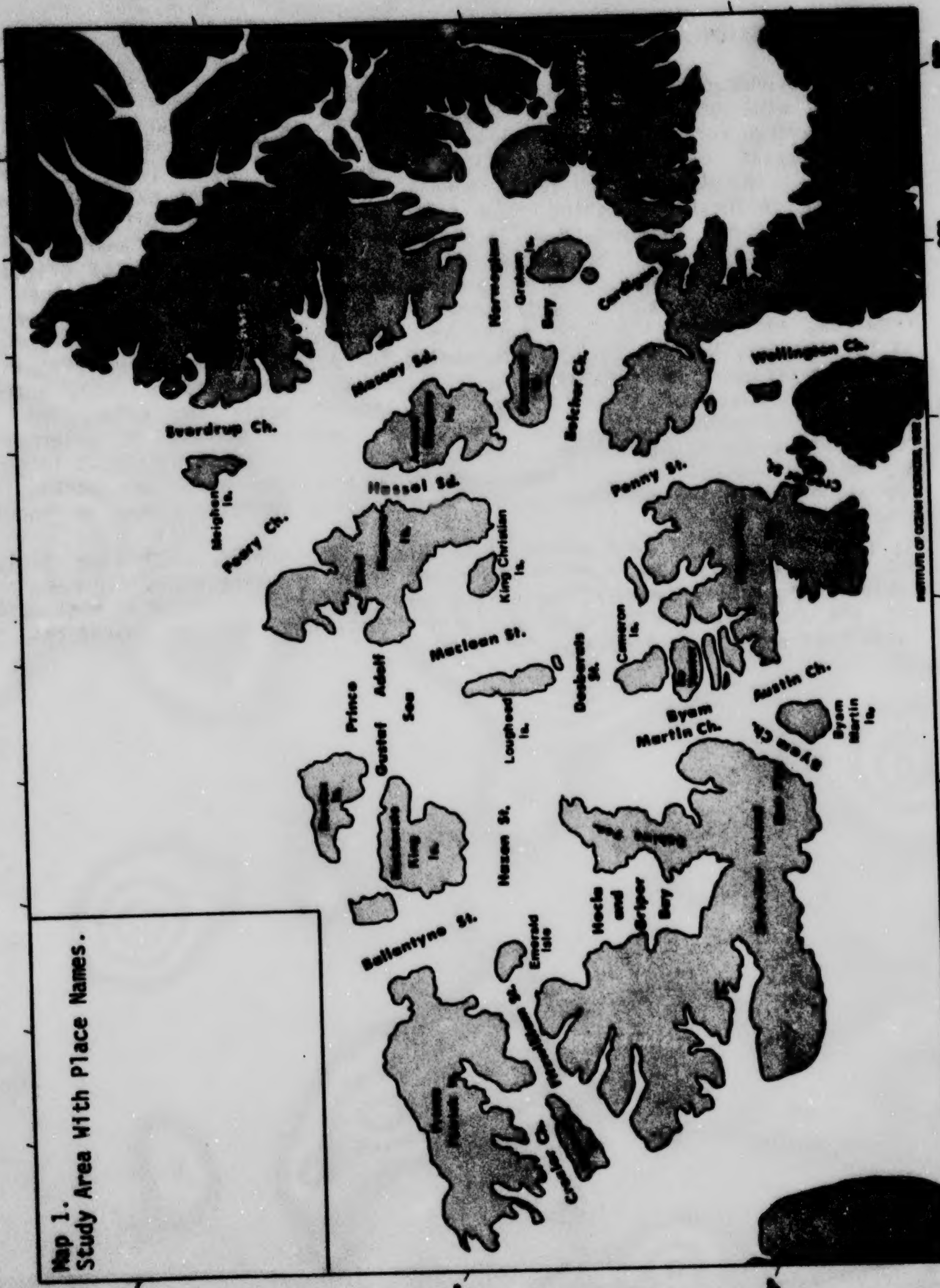
1. INTRODUCTION

The Sverdrup Basin, including the Queen Elizabeth Islands, has been the focus of wide scale, intensive seismic surveys, and well drilling in the ongoing search for oil and gas. From 1974 to June 1984, a total of 45 seismic surveys logged nearly 25,000 km of transects, most of which (75%) were shot offshore. In addition, 80 wells were drilled for wildcat exploration and discovery delineation; again, many (31%) were carried out offshore. The majority of these surveys and wells were the responsibility of Panarctic Oils Limited, the sole or lead sponsor of 32 seismic programs and 68 drilling operations. In support of this hydrocarbon search, thousands of tonnes of drilling wastes were disposed, thousands of flights for resupply were required, and numerous staging bases were constructed, some permanently such as the largest, Rea Point. Unfortunately, for purposes of regional planning, impact assessment or regulatory guidance, many basic details (who, where, when, how, what) of these offshore development activities exist, but in uncompiled records, files, and reports in several offices of government regulatory agencies and oil companies. Such status makes it difficult to gain any quick, overall appreciation (much less specifics about one particular operation) of where we have been when deciding where and how we should proceed.

The objective of this report is to compile thoroughly, synthesize simply, and depict clearly such details under one cover by using maps, figures, and tables. The actual documents and files were examined first-hand in most cases and are referenced with original record notations in the appendices to facilitate any future scrutiny.


Map 1.
Study Area With Place Names.

2. STUDY AREA

The study area, as shown on Map 1, consists of the islands and waterways in the Sverdrup Basin Region of the Queen Elizabeth Islands, Northwest Territories. The study area includes the area north of the 75th parallel bounded by a line joining the northern headlands of the Prince Patrick, Borden, Ellef Ringnes, and Axel Heiberg islands. The eastern and western limits of the study area were defined as the 85th and 125th degrees of longitude respectively.

Topography of the Queen Elizabeth Islands in the Sverdrup Basin area is characterized by areas of rugged or rolling terrain reflecting the underlying Pre-cambrian granite or gneiss formations interspersed with flatter areas based on sedimentary formations. Glacial drift of varying depth covers much of the Region and often modifies the influence of the bedrock on topography. In the far north, Axel Heiberg Island features alpine peaks, generally ice-covered, at 1,800 m in elevation. To the south and southwest lie hills, plateaus, and rolling plains. Most of the Region is below 300 m, but occasional uplands exceed 600 m and on Melville Island reach 1,050 m. Along the margins of the Arctic Ocean lies the Arctic Coastal Plain, extending from Meighen Island through the western Queen Elizabeth Islands to western Banks Island. This feature is unusually flat and consists of fine, unconsolidated sediments containing massive ground ice.

Water depths in the area tend to decrease from north to south. Depths range from 500 m to 700 m in the Prince Gustaf Adolf Sea and Peary and Sverdrup channels. In the central portion of the study area, the relatively deep waters of 400 m or more are separated into distinct basins by zones of shallow water extending northward across Desbarats Strait to Lougheed Island and northward across Belcher Channel to Amund Ringnes Island. Depths of passages in the Cordigan, Penny, and Fitzwilliam straits, and Austin and Byam channels range from 100 m to 250 m.

An important factor affecting the location and timing of hydrocarbon exploration activities is the seasonal sea ice coverage in the area. During the winter months, the majority of the Sverdrup Basin Region is covered by a combination of first-year and multi-year sea ice floes. Since, in many channels, the horizontal displacement of the ice cover is limited to 15 m or less during the winter, sea ice provides a stable platform for offshore seismic surveys and drilling activities. However, during the spring and summer months, the deformation and thawing of the sea ice cover preclude over-ice movement of vehicles or the use of sea ice platforms for offshore drilling.

3. ACCURACY OF MEASUREMENTS

Throughout the preparation of this report, care has been taken to ensure the accurate transcription of temporal, quantitative, or geographical information from the original sources. It should be noted, however, that the precision of information contained within the original records or source documents was not uniformly high. As well, documentation of some individual activities was found to be unavailable, missing or incomplete at the time when information for this report was being compiled; thus, the descriptions of those activities in this report is similarly incomplete.

Specific areas of imprecision in the original information should be noted as follows:

(a) Timing and Location of Seismic Surveys: The exact period during which field operations are carried out is to some degree dependent on the condition of sea ice in the survey area; since these conditions cannot be accurately predicted well in advance, proponents' proposals for survey operations will only specify the general three- to four-month period during which these operations will be carried out. Information regarding the location of seismic transects is provided by the proponents to DIAND in the form of seismic lines plotted on 1:250,000 scale maps. This information is then re-plotted on similarly-scaled Historical Land Use Maps by DIAND staff. Transcription errors between the proponents' original documents and DIAND maps and between the DIAND maps and IOS plots may be cumulative. Therefore, a positional error of plus or minus 3 km should be applied to survey lines plotted in this review.

(b) Quantities of Drilling Mud Components: Mud records submitted by well operators to COGLA listed "rounded" quantities of mud components in Imperial units up to 1979 and in Metric units from 1980 to the present. To compensate for conversion and rounding errors, quantities of more than 1,000 kg should be considered as accurate within plus or minus 50 kg, while an error factor of plus or minus 10 kg should be applied to quantities under 1,000 kg.

Some government files pertaining to specific seismic or drilling operations were found to be missing or otherwise unavailable during the compilation of information for this report. Thus, the proponents and vehicles used in four 1974 seismic programs could not be identified, and only limited descriptions of the following wells were obtained:

(a) Panarctic Norcen AIEG et al Grassy I-34;
(b) Panarctic Drake F-76;
(c) Panarctic W. Bent Horn G-02.

Deficiencies in available files or documents are noted on the Appendices A and C.

4. GEOPHYSICAL EXPLORATION

4.1 Introduction

Beginning in 1974, the Sverdrup Basin Region has been a focus of extensive geophysical exploration, mostly sponsored by petroleum companies. As a result, the majority of islands and channels in the central Basin have been subjected to various seismic activities. In some areas, such as the Sabine Peninsula on Melville Island and offshore areas west of Lougheed Island, the cumulative seismic exploration activities over 10 years has been exceptionally high. Perhaps not unexpectedly, this is a function of oil and gas discoveries in this part of the Sverdrup Basin, in particular, within or in the vicinity of the Hecla and Drake gas fields near Sabine Peninsula, the Skate and Cisco oil and gas discoveries near Lougheed Island, and the Bent Horn oil discovery on Cameron Island. This direct relationship between high seismic exploration activity and actual hydrocarbon discoveries is derived from two factors. Firstly, detailed, intensive seismic surveys are normally undertaken when preliminary research indicates geological formations of interest to petroleum operators. Secondly, should an oil or gas body be discovered as a result of subsequent drilling, additional seismic surveys aid in the delineation of the discovery. Conversely, seismic coverage tends to be less intensive in areas removed from known or potential oil and gas bodies; here the emphasis is placed on general profiling of relatively unknown areal geology.

4.2 Field procedures

4.2.1 Timing of operations

Seismic surveys in the Sverdrup Basin are normally carried out in either or both of two distinct field seasons. Surveys confined to land masses may be scheduled for 15 September-15 December or 15 March-25 May, periods when the active layer is sufficiently frozen to permit the use of wheeled or tracked vehicles for overland travel. As well, daylight is available during some portion of these periods to assist survey crews. Fieldwork is normally not undertaken during the period 15 December-15 March because of darkness and extreme cold. Offshore surveys are normally scheduled for the period 15 March-25 May, when the sea ice is sufficiently thick and stable to support over-ice vehicle traffic. Operations are terminated by 25 May to ensure that seismic crews are off the sea ice prior to the onset of thawing temperatures and breakup (B. Singletary, pers. comm. 1984).

Between 1974 and 1976, there was a marked tendency for the majority of seismic programs to be carried out during the spring season (Figure 1). Although most seismic exploration included transects shot on land, 13 of 27 programs involved some amount of offshore exploration, and thus, were scheduled when sea ice was sufficiently frozen. In 1977, the only year in which fall seismic programs outnumbered spring programs, one offshore program was undertaken between mid July and late September near Little Cornwallis Island (EPS File NW 1710-Land Use Application). Although details of this program were not acquired for this report, the timing of the surveys (the open water is usually present during this period) and the reported use of airguns as an energy source suggest that a seismic vessel was used.

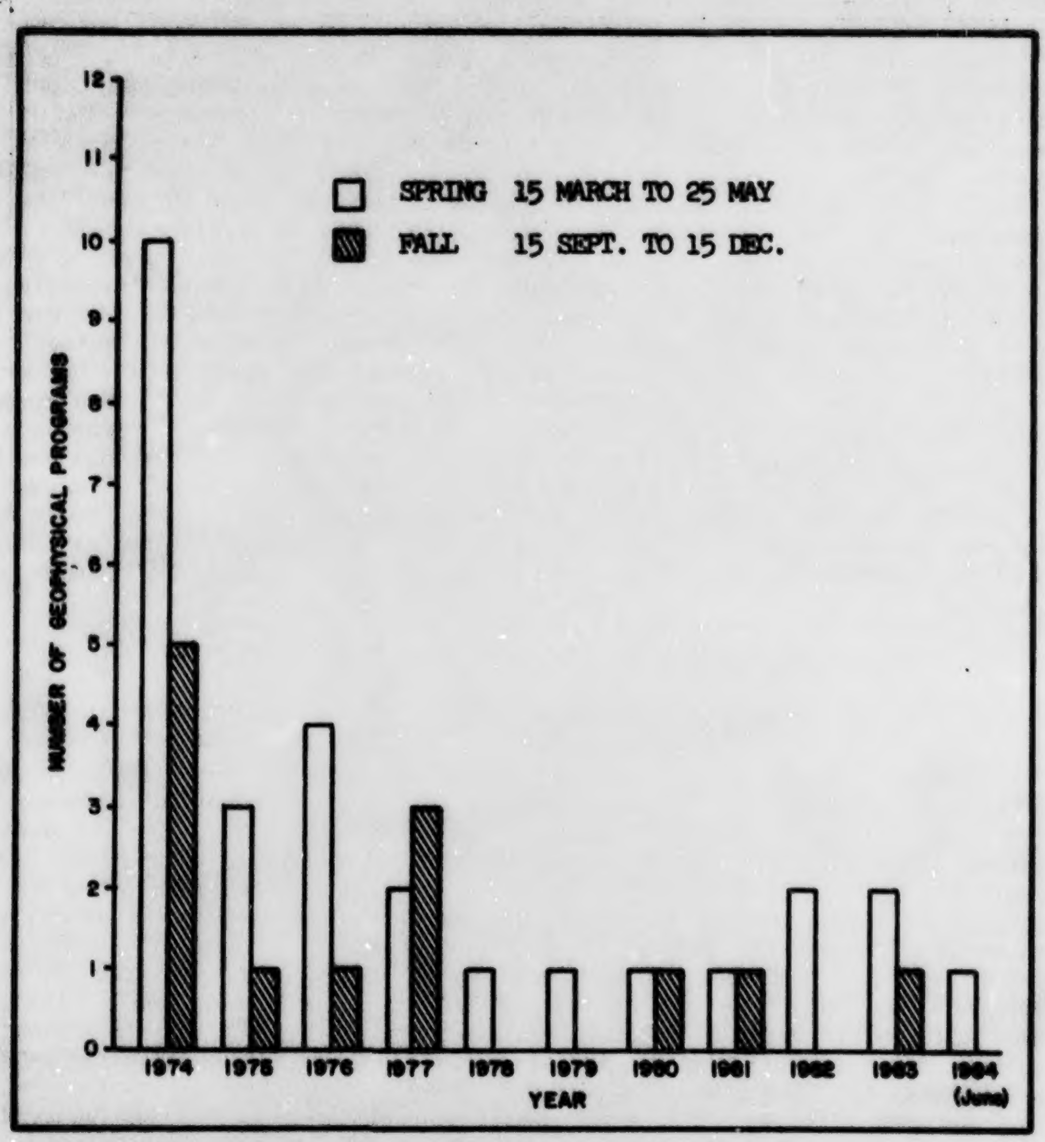


Figure 1. Geophysical Exploration Programs Undertaken During Spring and Fall Field Seasons, 1974 to 1984.
(N.B. The dates of four programs in 1974 and one program in 1981 were not recorded and, therefore, not included in these totals.)

Between 1978 and June 1984, the overall number of programs, especially in the fall declined from the period 1974 to 1977. This decline in fall programs coincided with increasing interest in offshore exploratory drilling. Consequently, more seismic exploration activities (10 of 13 programs) were directed to offshore areas and scheduled for the spring. Two of the offshore surveys occurred during the fall. The first survey was carried out between 30 August and 15 September 1976 near Cornwall Island (DIAND Land Use Permit file N151-B6), while the second occurred between 15 July and 30 September 1977 between Bathurst and Little Cornwallis islands (EPS Land Use Application File NW 1710). Although details of these operations were lacking, both surveys were presumably carried out using seismic vessels rather than on-ice field crews.

4.2.2 Vehicle use

Various types and numbers of vehicles are used for seismic survey operations in the Sverdrup Basin, depending on the expected terrain, the length of the survey and, to some degree, the preferences of the company contracted for the survey. A common characteristic of most vehicles is a wheel or track configuration which distributes the weight of the vehicle over a relatively large, surface contact area. The reduced ground pressures aid in avoiding disturbances to surficial soils and vegetation on land areas, and enhance the safety of the vehicle's passage over sea ice.

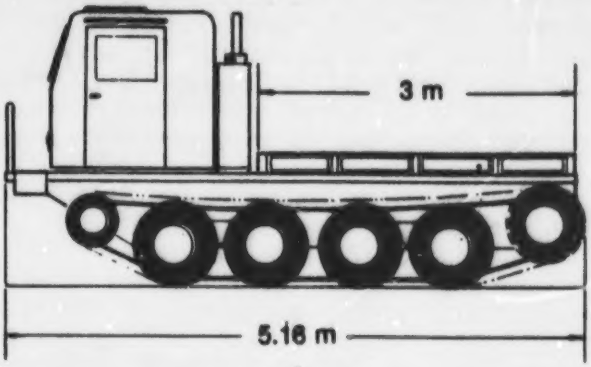
Early seismic parties utilized wheeled Kenworth or tracked Caterpillar tractor rigs as primary transporters of seismic equipment and crew support structures mounted on wheeled trailers or sledges. More recently, the Foremost FN60 and FN110 series of tracked vehicles (Figures 2 and 3) have come to be extensively used in a variety of roles including: geophysical equipment platforms, personnel transports, and chassis for mobile camp structures.

4.2.3 Energy sources and shot spacing

Two principal explosives are used depending on whether the seismic operation is on land or offshore. Geogel, a 60% nitroglycerine-based explosive, is employed for land shots in quantities ranging from 0.5 to 23.0 kg, depending on the charge hole depth and energy diffusion characteristics of geological formations surrounding the shot site. Charge sizes are increased in response to the increased charge hole depth or the decreased density (and hence greater diffusion of the explosive energy) of the surrounding material. Ice refraction studies carried out offshore generally use 40 grain Aquaflex, a linear energy source with an explosive equivalence of 0.008 kg of dynamite per metre of Aquaflex. At each shot site, a 7.5 m length of Aquaflex is suspended 15 m below the ice surface where the sea ice is less than 2.5 m thick or 20 m below where ice is more than 2.5 m thick (B. Singeltary, pers. comm., 1984).

Spacing of seismic shots on land ranges from four and 15 shots per metre depending on the charge size, hole depth, and surrounding formations. Fifteen shots per kilometre is the norm for offshore operations (J. Hunder, pers. comm. 1984; D. Siegfried, pers. comm., 1984).

Unlike offshore seismic operations in southern waters where the use of explosive energy sources is generally discouraged by the Department of Fisheries and Oceans (DFO), explosives are sanctioned for use in Sverdrup Basin offshore areas due to the relatively low densities of fish and mammalian

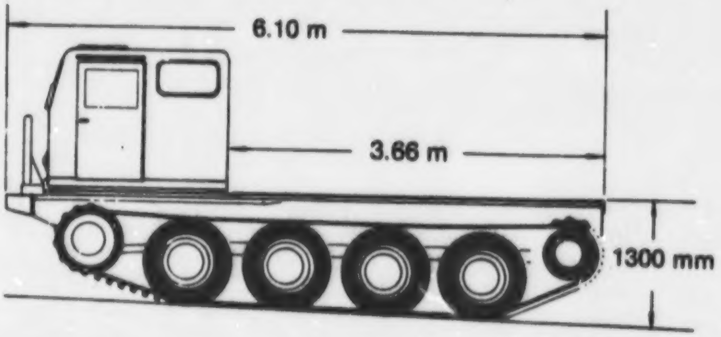


WEIGHTS		
Tare	10,500 lbs	4,770 kg
Payload	8,000 lbs	3,630 kg
G.V.W.	18,500 lbs	8,400 kg

GROUND PRESSURE*			
LOAD		PRESSURE	
Tons	Tonnes	PSI	kg/cm^2
0	0	1.3	0.09
1.5	1.4	1.6	0.11
3.0	2.7.	2.0	0.14
4.0	3.6	2.13	0.15

*6 in. (150 mm) penetration.

Figure 2. Foremost Nodwell FN60 Tracked Vehicle.
(Source: Canadian Foremost Ltd. portfolio, Calgary.)



WEIGHTS		
Tare	21,500 lbs	9,760 kg
Payload	20,000 lbs	9,080 kg
G.V.W.	41,500 lbs	18,840 kg

GROUND PRESSURE*

LOAD		PRESSURE	
Tons	Tonnes	PSI	kg/cm²
0	0	1.9	.13
3	2.7	2.4	.17
6	5.4	2.9	.20
8	7.2	3.3	.23
10	9.1	3.6	.25

*6 in (150 mm) penetration

Figure 3. Foremost Nodwell FN110 Tracked Vehicle.
(Source: Canadian Foremost Ltd. portfolio, Calgary.)

species in the Region (D. Wright, pers. comm., 1984). The difficulty in placing or removing airguns through sea ice is another reason why explosives are preferred for offshore surveys (D. Siegfried, pers. comm., 1984). The only known uses of airguns in Sverdrup offshore areas were for the 1976 survey sponsored by Mobil Oil Limited in the vicinity of Cornwall Island (DIAND Land Use Permit file N151-B6) and a 1977 survey for the Polar Gas Project which investigated subsea geology between Bathurst and Little Cornwallis islands (EPS Land Use Application File NW1710). Again, since details were not available at the time of writing, the timing of the surveys suggest that the airguns were towed by a ship.

4.3 Exploration activities, 1974 to 1984

4.3.1 Operator sponsorship of seismic surveys

Forty-five geophysical survey programs were carried out in the Sverdrup Basin between 1974 and June 1984, 40 of these being sponsored by petroleum operators. Panarctic Oils Limited was most active with 32 programs carried out under its sponsorship. Five other petroleum operators sponsored a further seven programs between 1974 and 1977. One program each was carried out by the Geological Survey of Canada (1974) and the Polar Gas Project (1977). Four programs' sponsorship could not be determined from information available at the time of this compilation (Figure 4). Panarctic's geophysical exploration activities were most intense in 1974, when 11 of its 32 programs were carried out. In 1974 and 1975, the number of Panarctic programs declined, remaining relatively constant to 1983, with an average of two programs per calendar year. One program was carried out by Panarctic to June 1984.

Panarctic's sponsorship of seismic surveys overshadows the limited involvement of the other five oil companies in seismic explorations. Mobil Oil Canada Limited was the second most active sponsor in the Sverdrup Region (three programs) while Elf Oil Explorations Limited, Great Plains Oil and Gas Limited, Imperial Oil Limited, and Sun Oil Company Limited each sponsored a single seismic program. Of these five companies, only Mobil carried out more than one program in a single year. All programs of these five companies were completed prior to 1978. Panarctic has continued as the sole sponsor of seismic exploration from 1978 to the present.

Panarctic's surveys have concentrated in the central Sverdrup Basin. Specifically, seismic surveys focused on six areas: Melville Island (Sabine Peninsula), Cameron Island, Lougheed Island (including offshore areas to the west, Hazen Strait (east of Mackenzie King Island), Maclean Strait, and the Prince Gustaf Adolf Sea (northwest of Lougheed Island). Less intensive seismic exploration by Panarctic occurred on Bathurst, Byam Martin and Alexander islands, Emerald Isle, Hecla and Griper Bay on Melville Island, and Hazen Strait south of Mackenzie King Island.

In contrast to Panarctic's widespread programs throughout the central Basin, the seven programs of oil companies other than Panarctic were geographically restricted. Six surveys sponsored by Imperial, Great Plains Oil and Gas, and Elf were confined to the land masses and nearshore areas of Cornwall, Bathurst and Prince Patrick islands. An exception was Sun Oil's more extensive program designed, not for profiling subsea geology but, for determining late winter sea ice thicknesses in the Arctic Islands (APOA, 1977). Under the umbrella of Sun Oil sponsorship, seven distinct sub-surveys

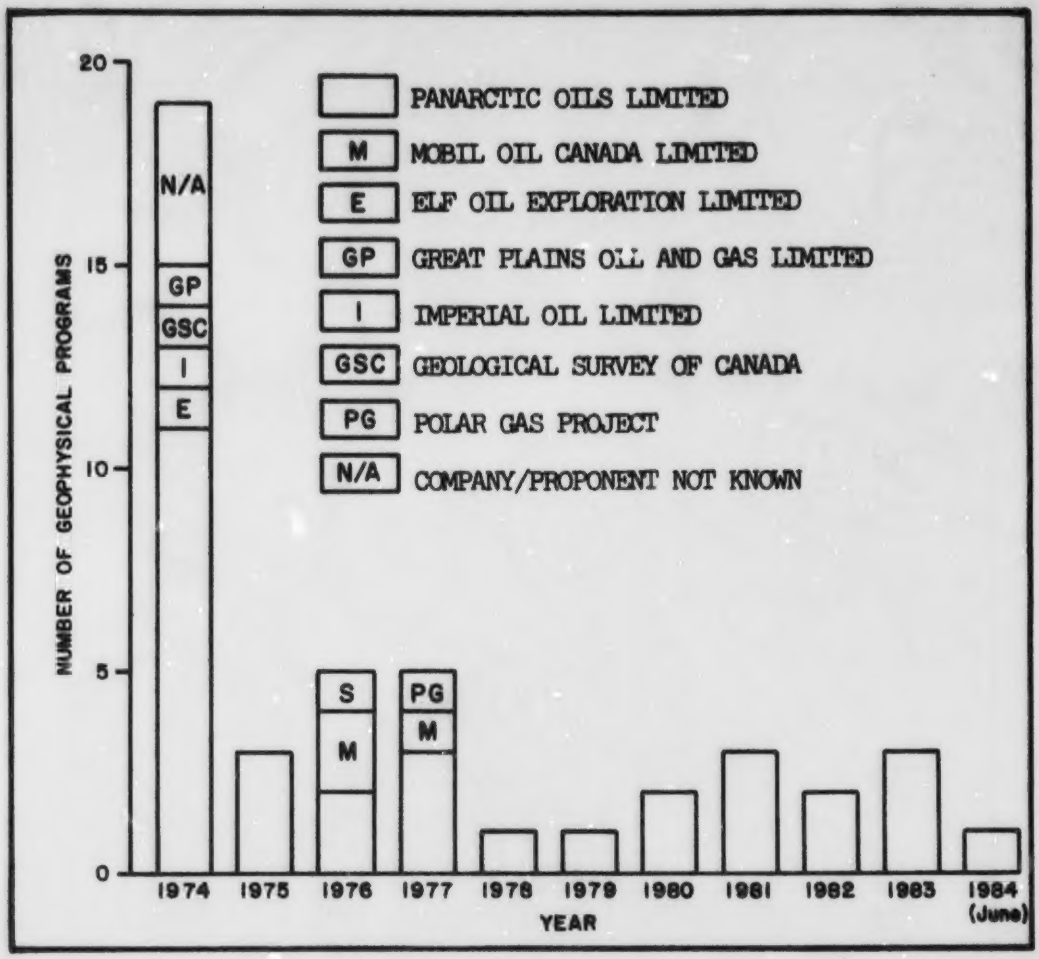


Figure 4. Geophysical Programs Carried Out by Companies/Proponents, 1974 to 1984.

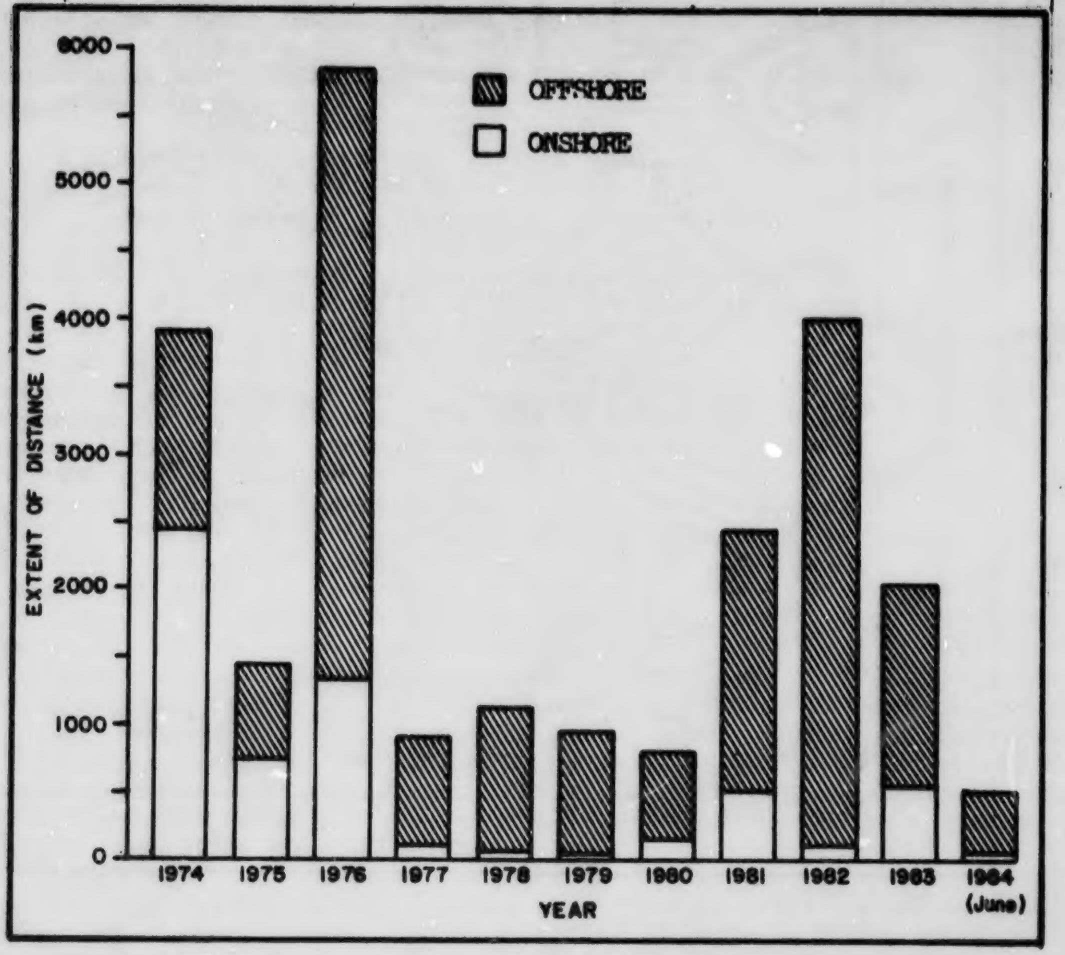
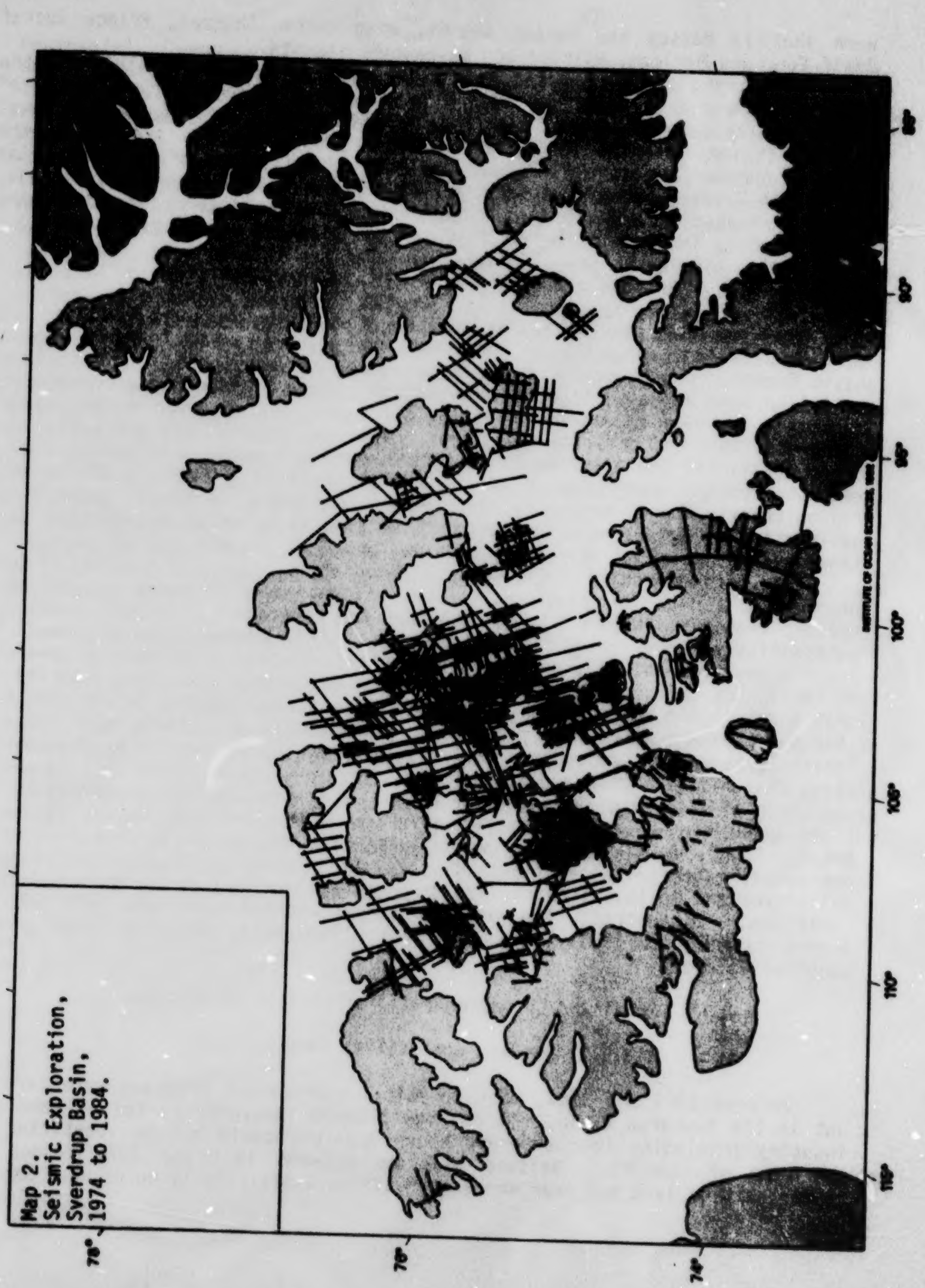


Figure 5. Total Kilometres of Onshore and Offshore Seismic Surveys, 1974 to 1984.



Map 2.
Seismic Exploration,
Sverdrup Basin,
1974 to 1984.

were shot in Massey and Hassel sounds, Byam Martin Channel, Prince Gustaf Adolf Sea, and Maclean, Wilkins and Ballantyne straits.

The seismic program of the Geological Survey of Canada in 1974 was the last in a three-year effort to determine the basic geological "architecture" of the Sverdrup Basin (Hobson, 1975). Located to the east of Amund Ringnes Island, it was intended to provide data for a north-south profile of the Basin. Another modest seismic survey under the auspices of the Polar Gas Project in Crozier Strait and between Bathurst and Little Cornwallis islands, was not related to oil and gas exploration, but was intended to determine subsea geology in the vicinity of proposed gas pipeline crossings.

4.3.2 Onshore and offshore seismic survey comparisons

Prior to 1974, technical limitations of existing offshore drilling rig equipment restricted drilling operations to onshore areas in the Sverdrup Basin Region. Consequently, industry-sponsored surveys tended to be confined to island land masses, although some very nearshore profiles were recorded to determine the seaward extent of geological formations observed during nearby onshore seismic and drilling operations. However, in 1974, the successful use of an artificial ice platform to support Panarctic's Hecla N-52 offshore well demonstrated the viability of offshore drilling in the Sverdrup Basin and, concomittantly, the necessity for more extensive, offshore geophysical exploration. Since then, the focus of seismic exploration has shifted away from onshore areas and toward offshore regions.

This offshore shift did not occur immediately after the successful test of the Hecla N-52 ice platform. Total kilometres of onshore and offshore seismic transects (Figure 5) indicate that the coverage of offshore areas was substantially lower than onshore areas in 1974, became roughly equal to onshore coverage in 1975, and was substantially greater than onshore coverage in 1976. The 1976 offshore total is somewhat misleading since the majority of that total (3,464 km) was shot by Sun Oil Company's survey for determining ice thickness. Given that this program is not directly comparable with surveys for the purposes of exploration drilling, subtraction of the Sun program total shows that offshore coverage is again less than onshore coverage in 1976.

From 1977 to June 1984, however, annual offshore coverage was three to 34 times greater than annual onshore coverage. The greatest annual offshore total (3,895 km) during this period was recorded in 1982, when Panarctic sponsored extensive investigations of the Norwegian Bay area, Hazen, Ballantyne and Maclean straits, and the southern portion of the Prince Gustaf Adolf Sea. In contrast, the greatest annual onshore total was only 565 km during Panarctic's 1983 surveys of Sabine Peninsula, Melville Island, and Lougheed Island.

4.3.3 Areal and chronological distribution of surveys

4.3.3.1 Seismic activities, 1974 to 1981

Between 1974 and 1981, 39 geophysical exploration programs were carried out in the Sverdrup Basin, all but one program sponsored by the oil and gas industry (excluding four programs whose sponsors could not be identified at the time of search). Seismic programs between 1974 and 1976 tended to concentrate on land and near shore at Melville (particularly on or near Sabine

Peninsula), Cameron, Bathurst and Byam Martin islands. Less intense land surveys were conducted on Lougheed, Cornwall, Prince Patrick, and Alexander islands, Isle Vanier, and Emerald Isle. Although some surveys included offshore transects, the majority were not devoted entirely to offshore exploration. The offshore exceptions included: surveys off the coasts of Ellef Ringnes Island (1974), Melville Island (1974), King Christian Island (1974), and Cornwall Island (1976), and an extensive 1976 survey of Massey and Hassel sounds, Maclean, Wilkins and Ballantyne straits, Prince Gustaf Adolf Sea, and Byam Martin Channel.

Later, between 1977 and 1981, the overall level of seismic exploration in terms of total kilometres shot declined, but shifted the survey focus from onshore to offshore regions. Seismic survey coverage centred on Maclean and Hazen straits, southern Prince Gustaf Adolf Sea, and the offshore areas to the west of Lougheed Island and to the east of Mackenzie King Island. Less intense survey activity occurred in Desbarats Strait and the offshore area south of Meteorologist Peninsula on Ellef Ringnes Island. Onshore programs extended or refined surveys of the previous three-year period on Bathurst, Melville and Cameron islands.

4.3.3.2 Seismic activities, 1982 to 1984

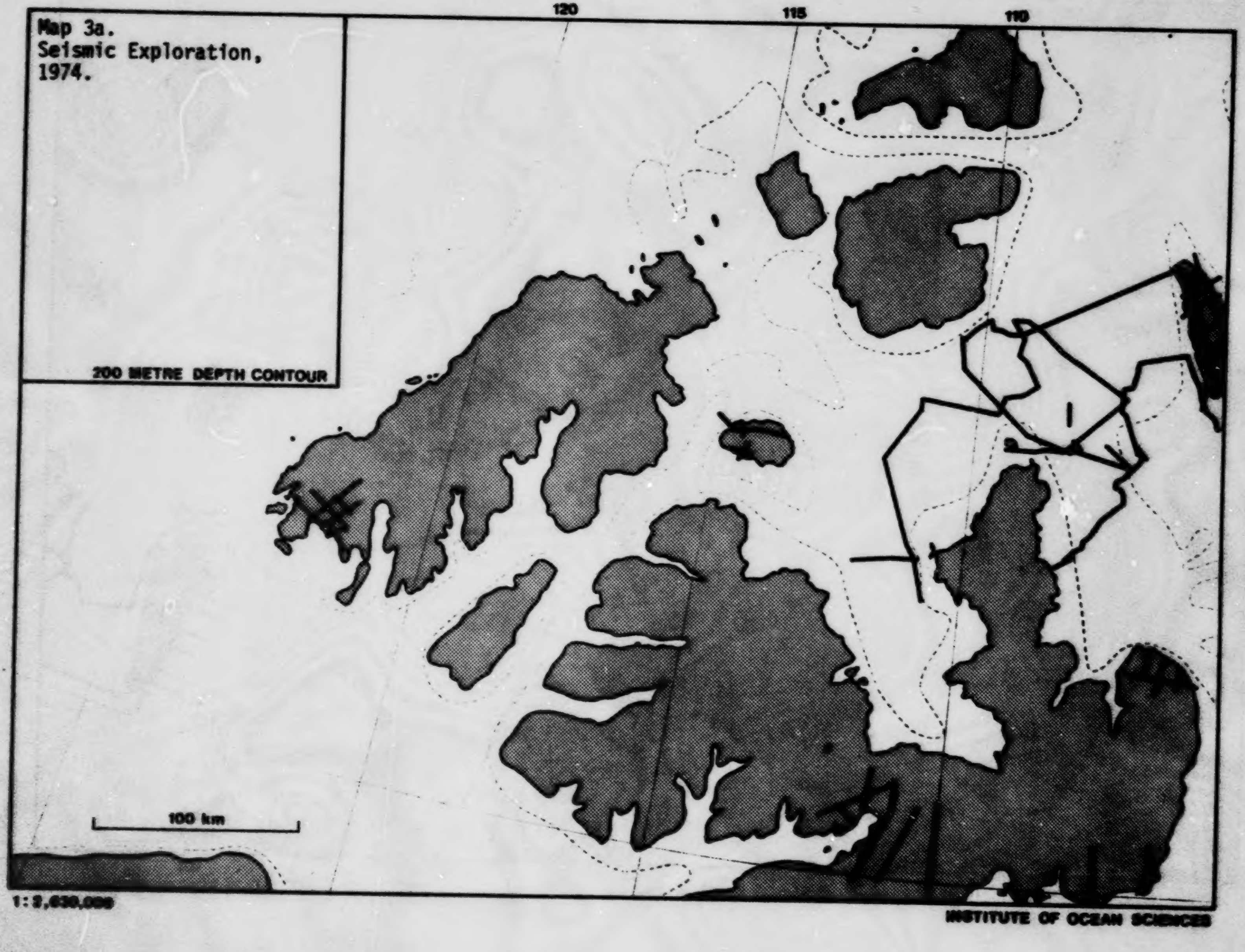
Between January 1982 and June 1984, Panarctic Oils sponsored six seismic programs in Hazen, Maclean and Ballantyne straits, in Prince Gustaf Adolf Sea, on Lougheed Island, and on Sabine Peninsula. Table 1 outlines seismic surveys undertaken during this period.

4.3.4 Projected seismic exploration

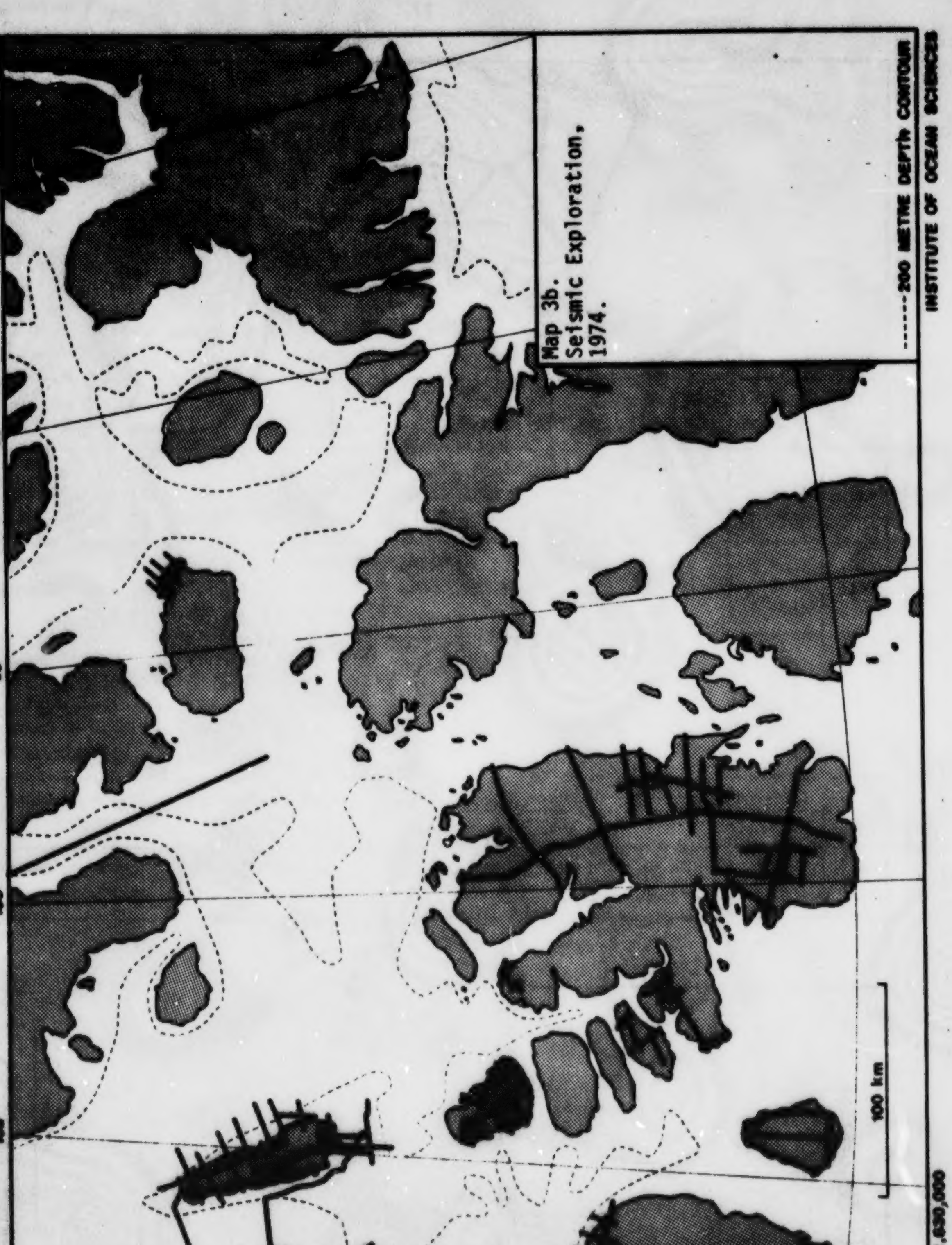
During the next two years (1985 and 1986), seismic survey operations will focus on the offshore areas adjacent to Lougheed Island (L. Franklin, pers. comm., 1985). Detailed surveys will very likely be carried out in the Maclean Strait Region, particularly, in the vicinity of the oil and gas discoveries at Panarctic's Skate B-80, Skate C-59, and Maclean I-72 wellsites. Seismic surveys may also examine the area surrounding Panarctic's gas discovery north of the Skate field at the Sculpin K-08 wellsite. Although the region off the west shore of Lougheed Island has already been extensively surveyed, additional localized surveys may be undertaken to aid in the delineation of the oil and gas reserves at the Cisco field.

Table 1. Seismic Surveys Undertaken, 1982 to 1984.

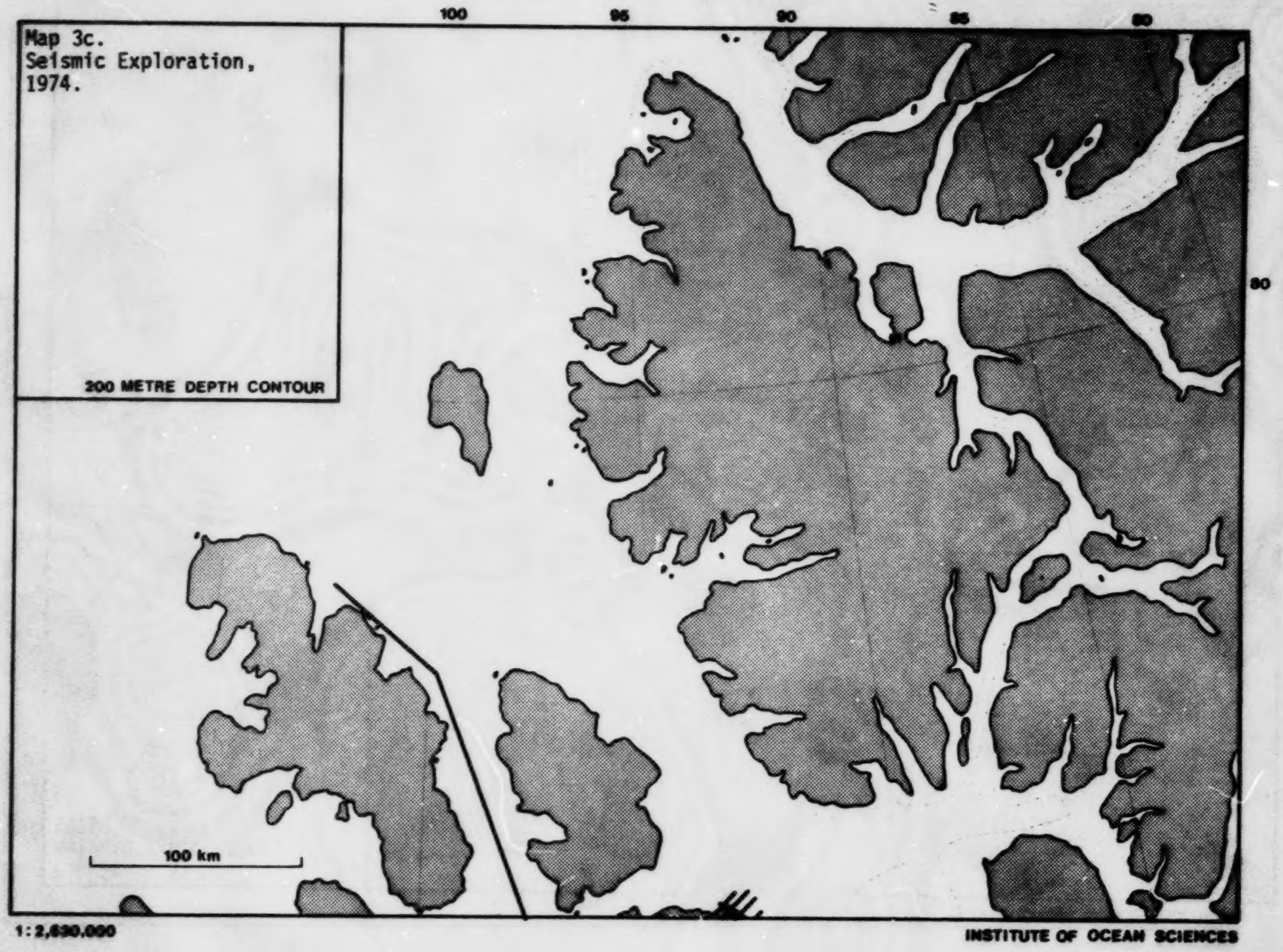
PERMIT NO.	SURVEY AREA	SURVEY PERIOD	ONSHORE ACCESS ROUTES (KM)	KMS. SHOT ONSHORE	OFFSHORE
EPS LU APPLICATION FILE NW9436	NORWEGIAN BAY, GRAHAM AND BUCKINGHAM ISLANDS	SPRING, 1982	66	60	830
DIAND LU PERMIT N81B645	HAZEN, MACLEAN AND BALLANTYNE STRAITS, PRINCE GUSTAF ADOLF SEA, NE LOUGHEED ISLAND	SPRING, 1982	85	53	3,066
DIAND LU PERMIT N83B848	MELVILLE ISLAND	SPRING, 1983	27	55	1,505
DIAND LU PERMIT N83B911	LOUGHEED ISLAND	SPRING, 1983	0	191	8
DIAND LU PERMIT N83B964	MELVILLE ISLAND	FALL, 1983	35	323	0
DIAND LU PERMIT N83B055	LOUGHEED ISLAND	SPRING, 1984	0	80	439



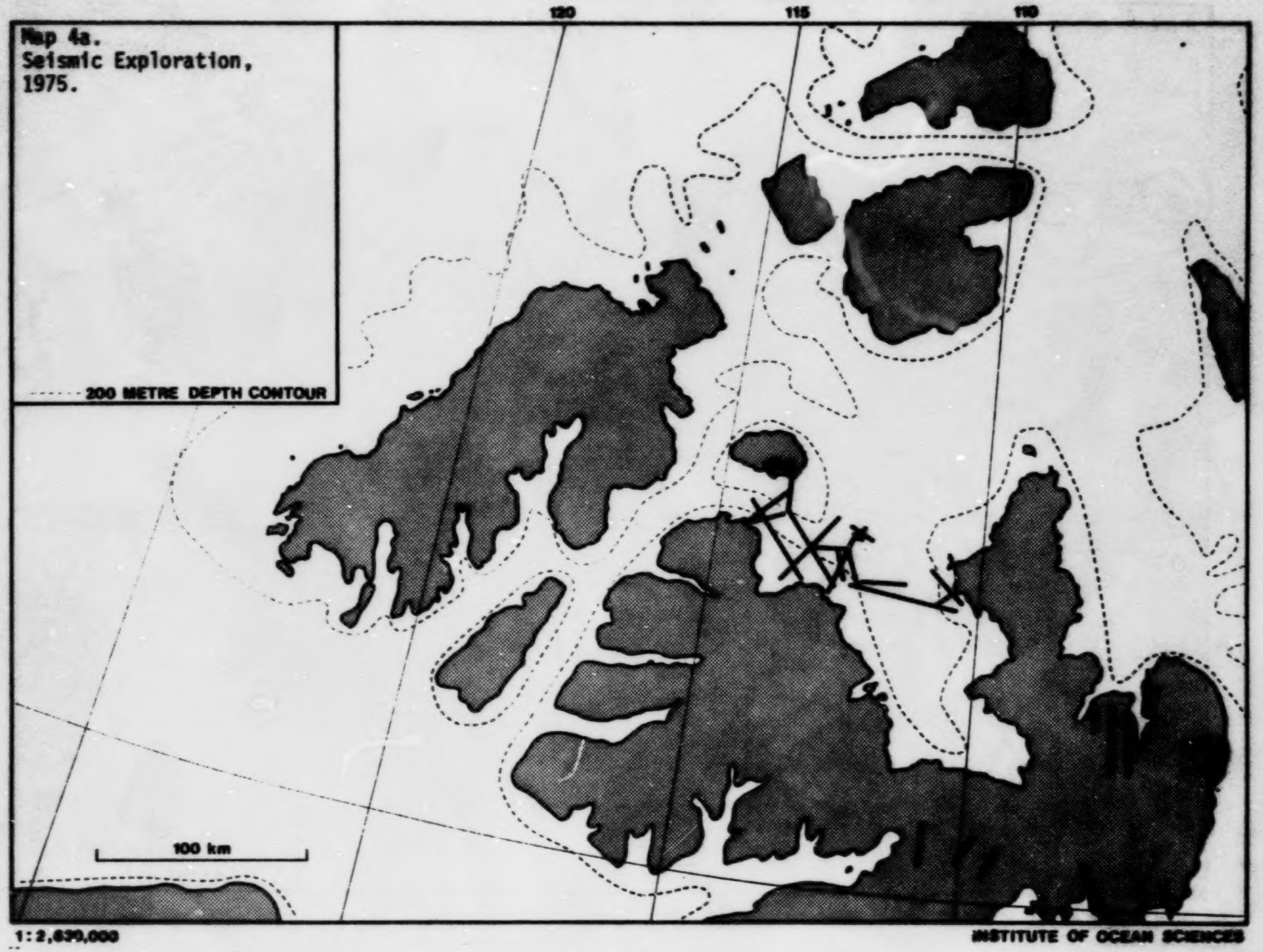
Map 3a.
Seismic Exploration,
1974.



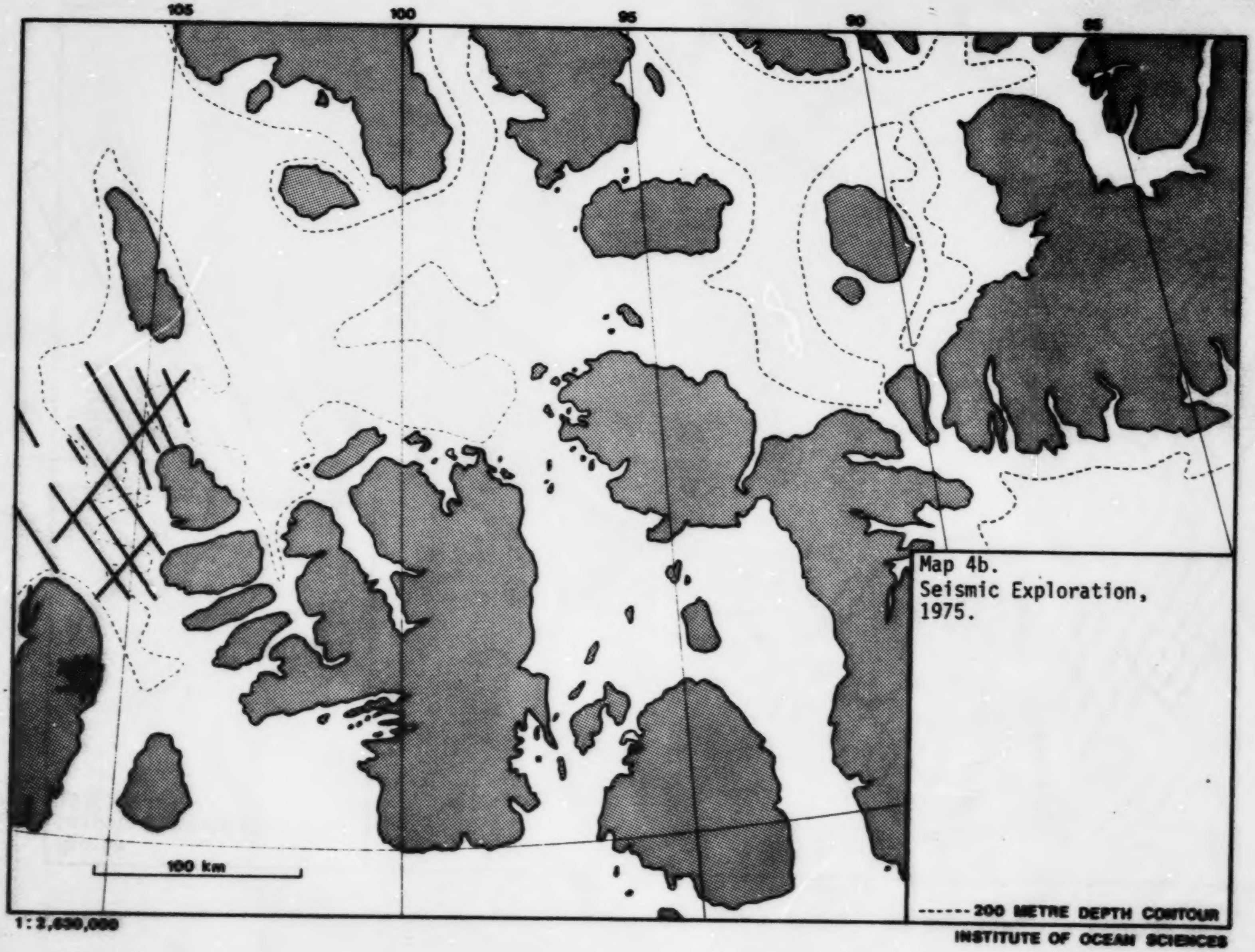
Map 3b.
Seismic Exploration,
1974.



Map 3c.
Seismic Exploration,
1974.

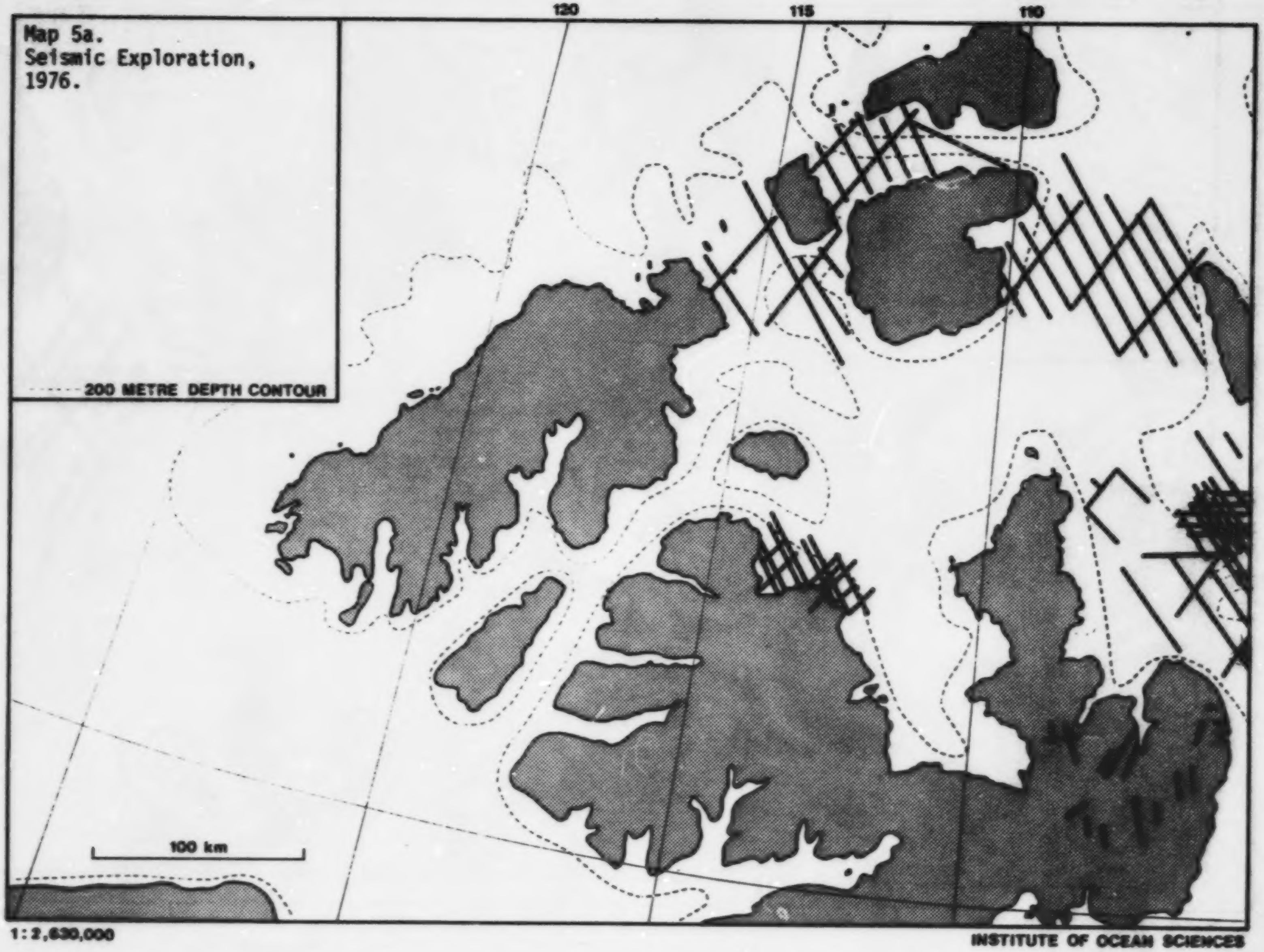


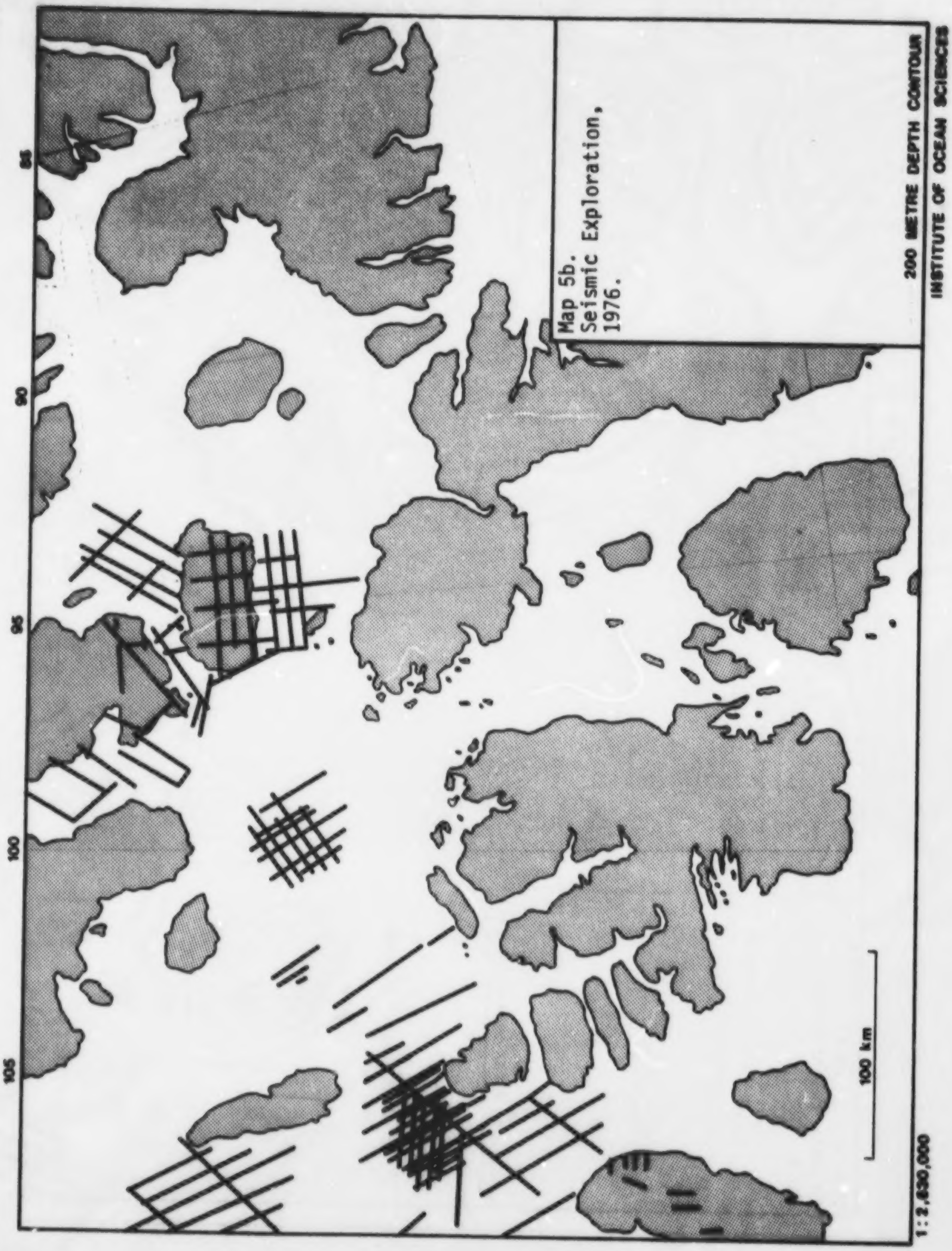
Map 4a.
Seismic Exploration,
1975.



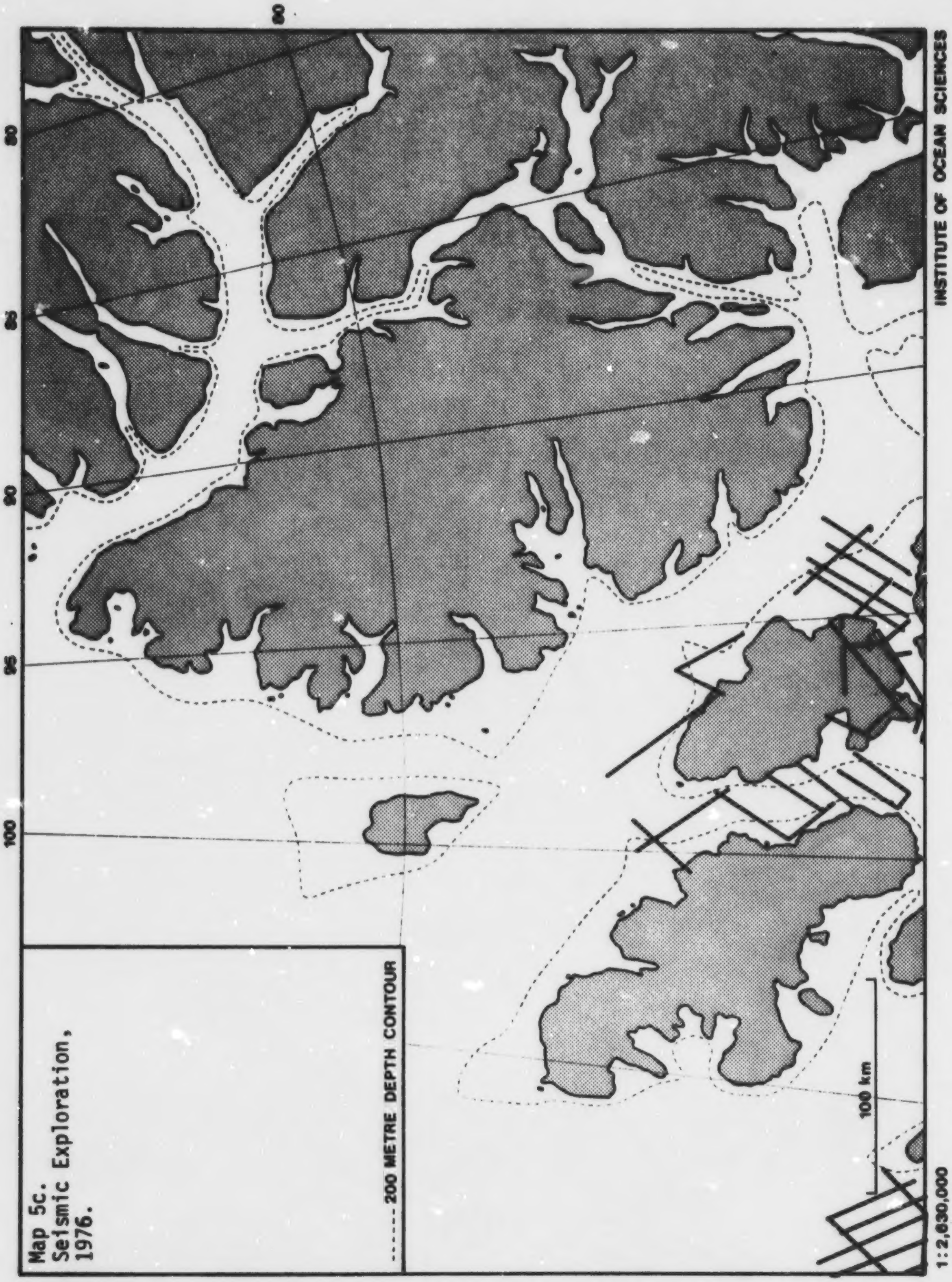
Map 4b.
Seismic Exploration,
1975.

Map 5a.
Seismic Exploration,
1976.

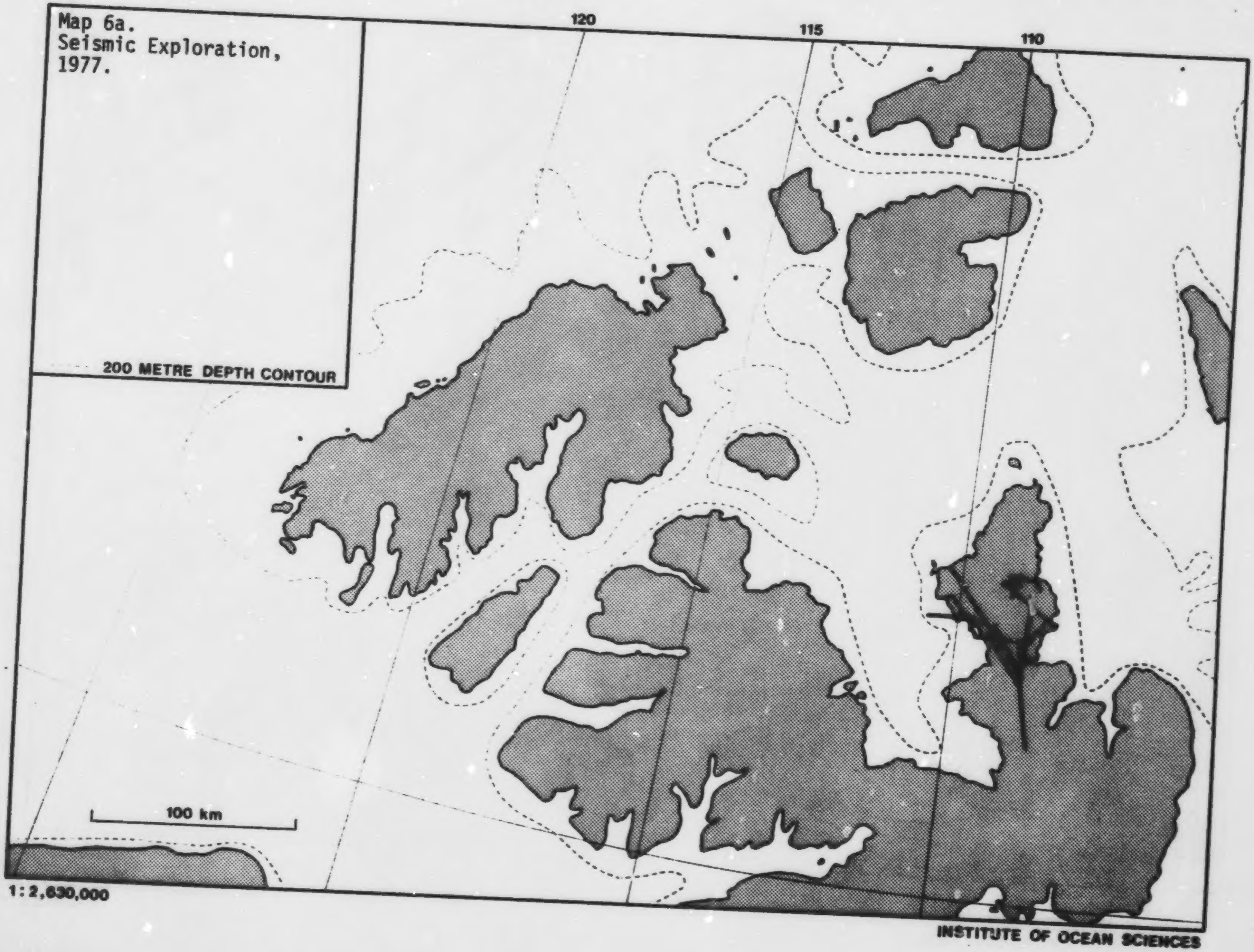




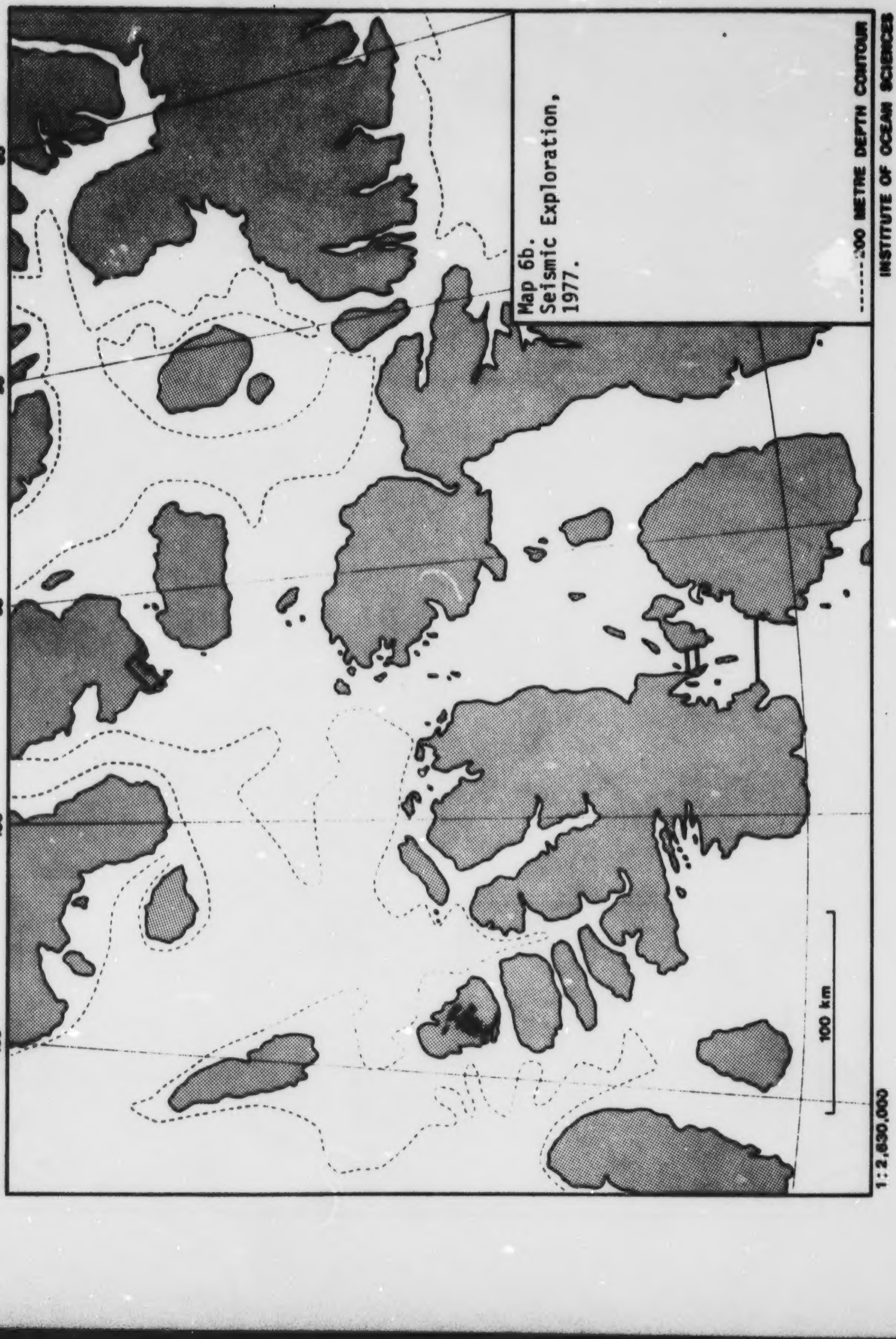
Map 5b.
Seismic Exploration,
1976.



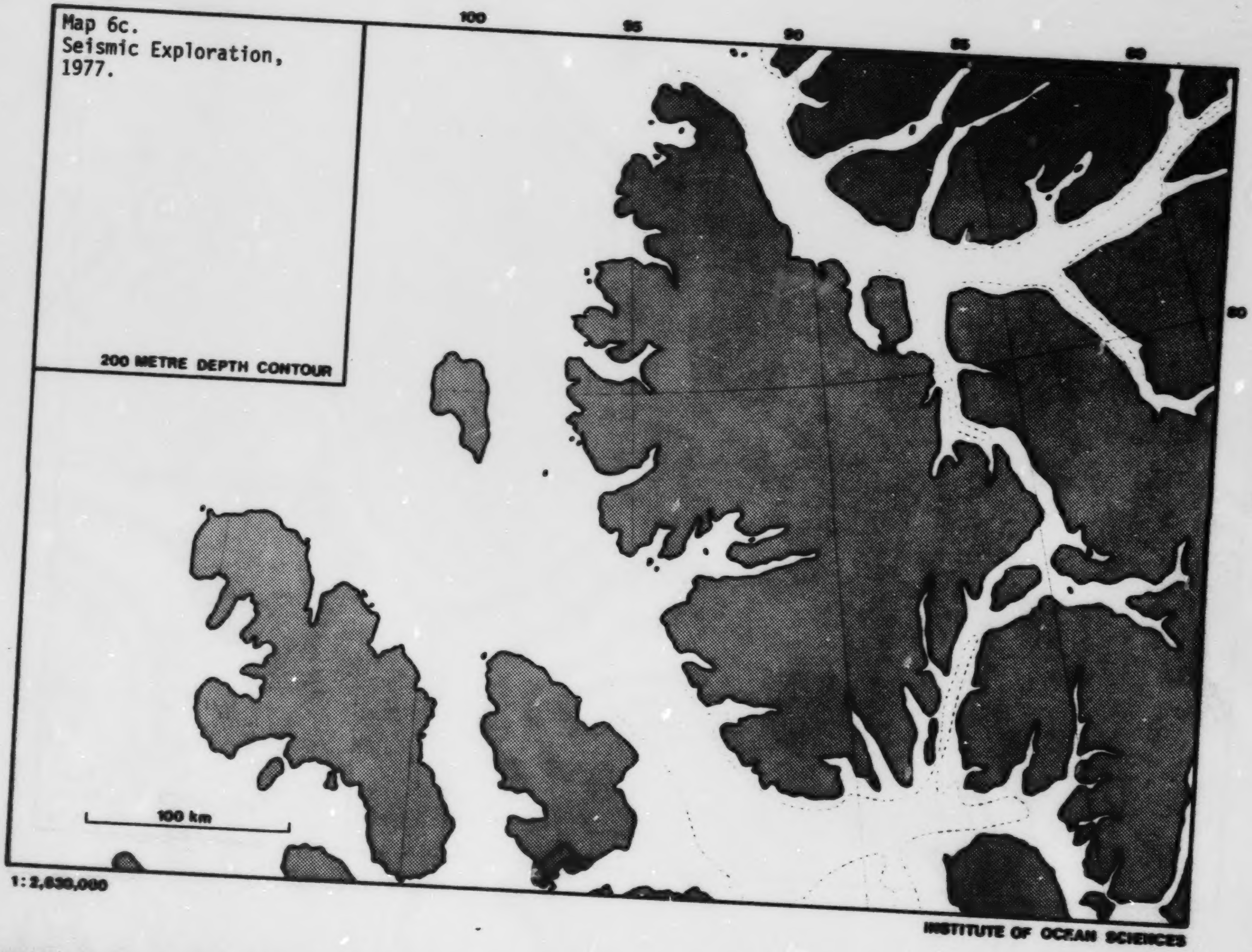
Map 5c.
Seismic Exploration,
1976.



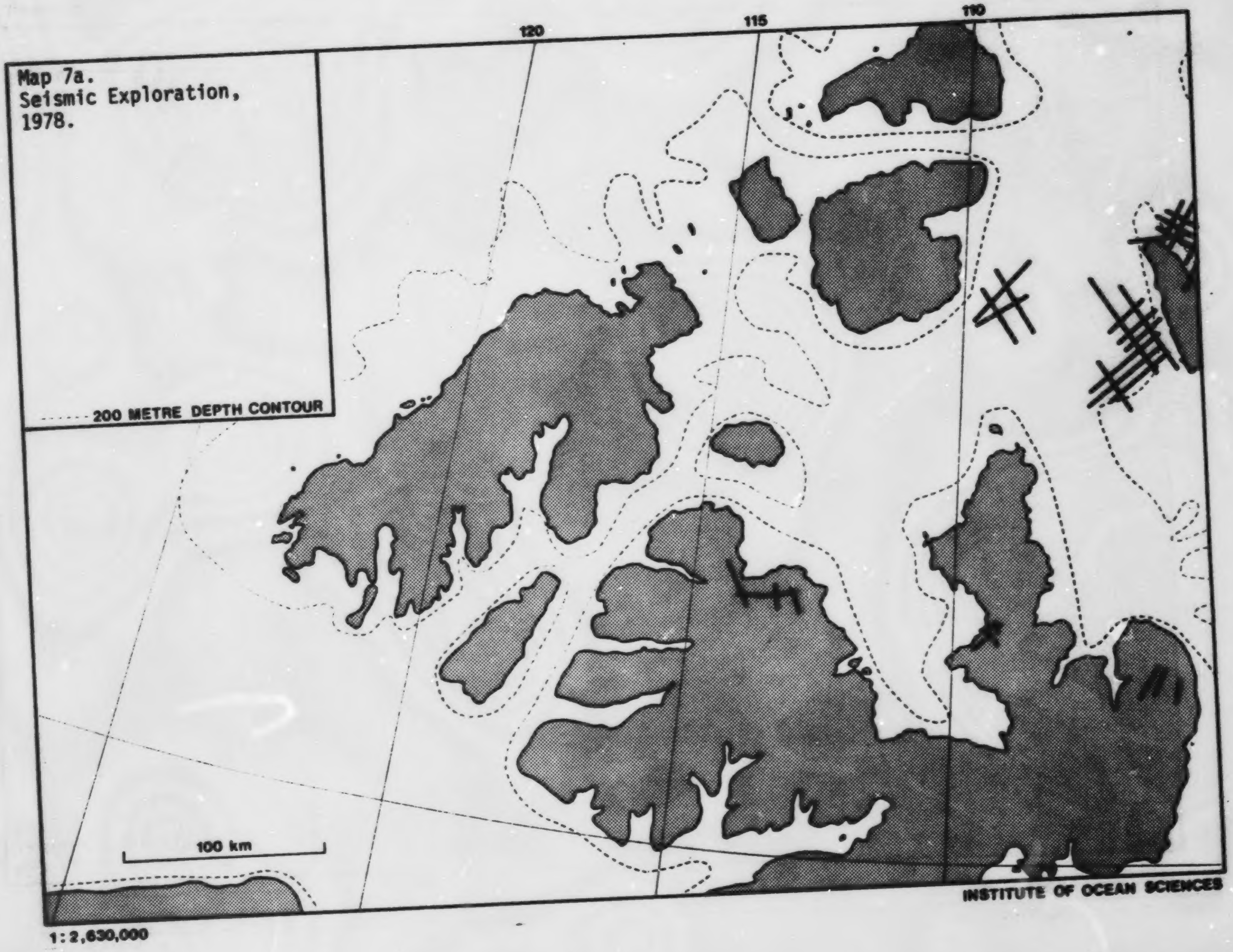
Map 6a.
Seismic Exploration,
1977.



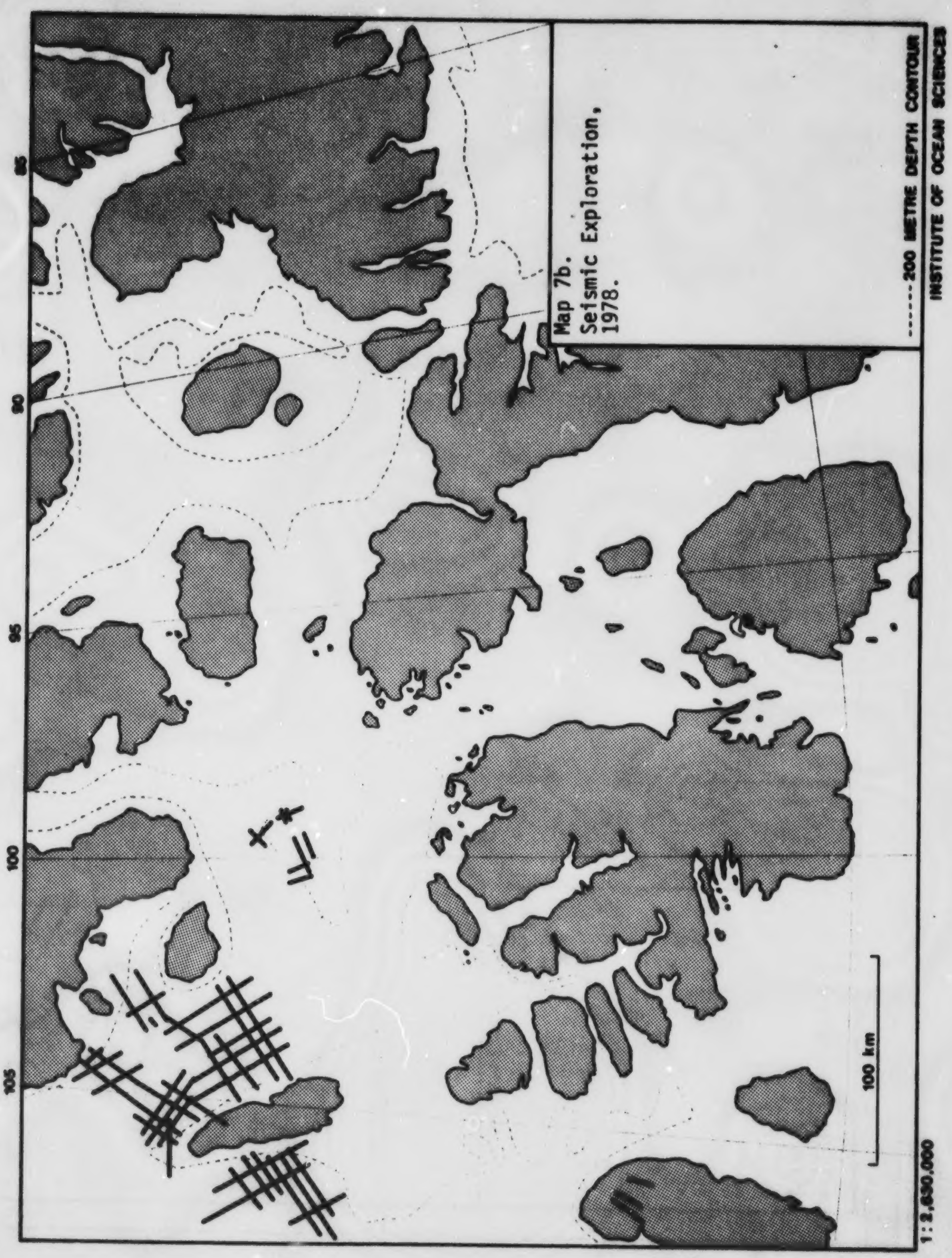
Map 6b.
Seismic Exploration,
1977.

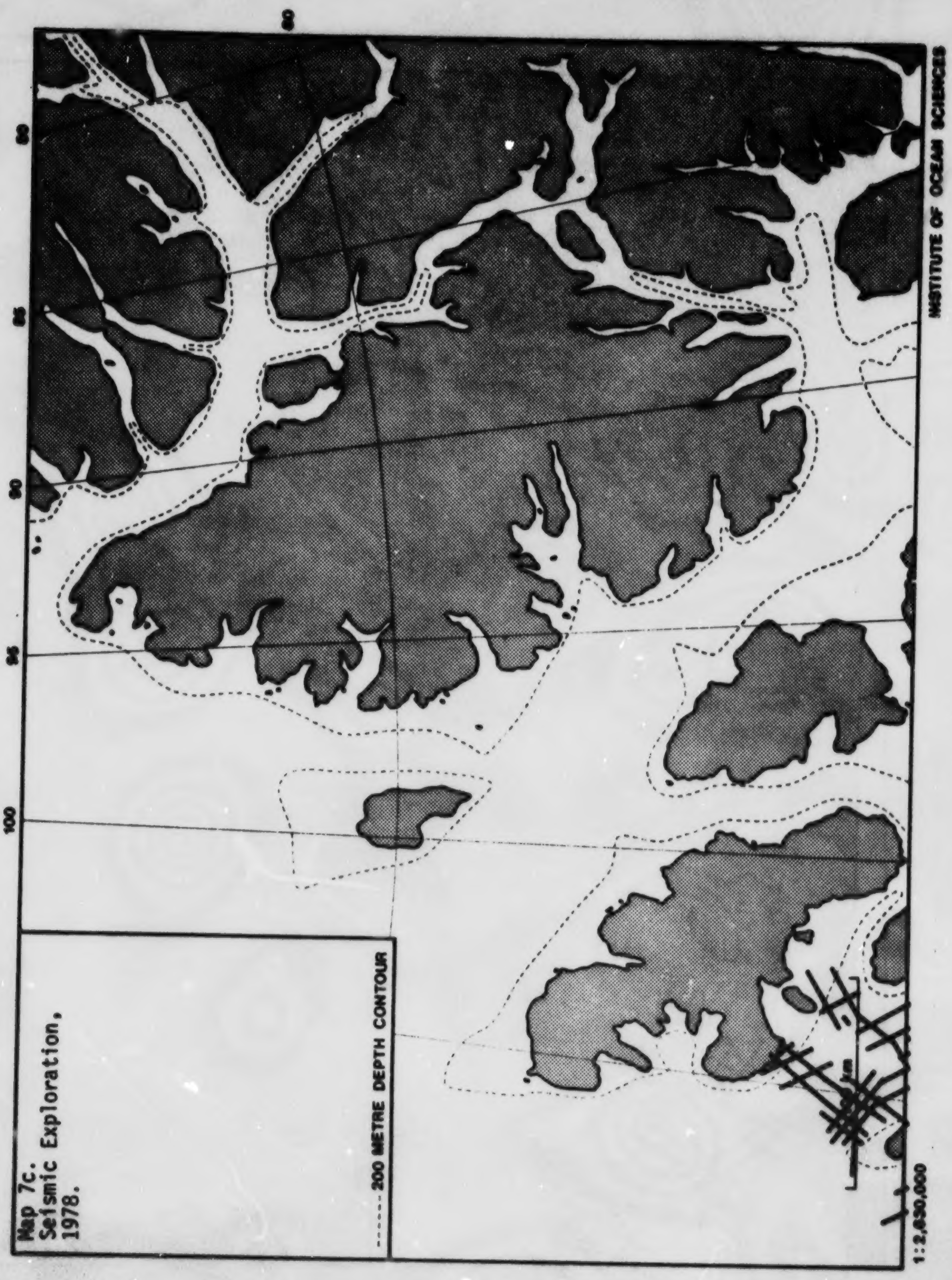


Map 6c.
Seismic Exploration,
1977.

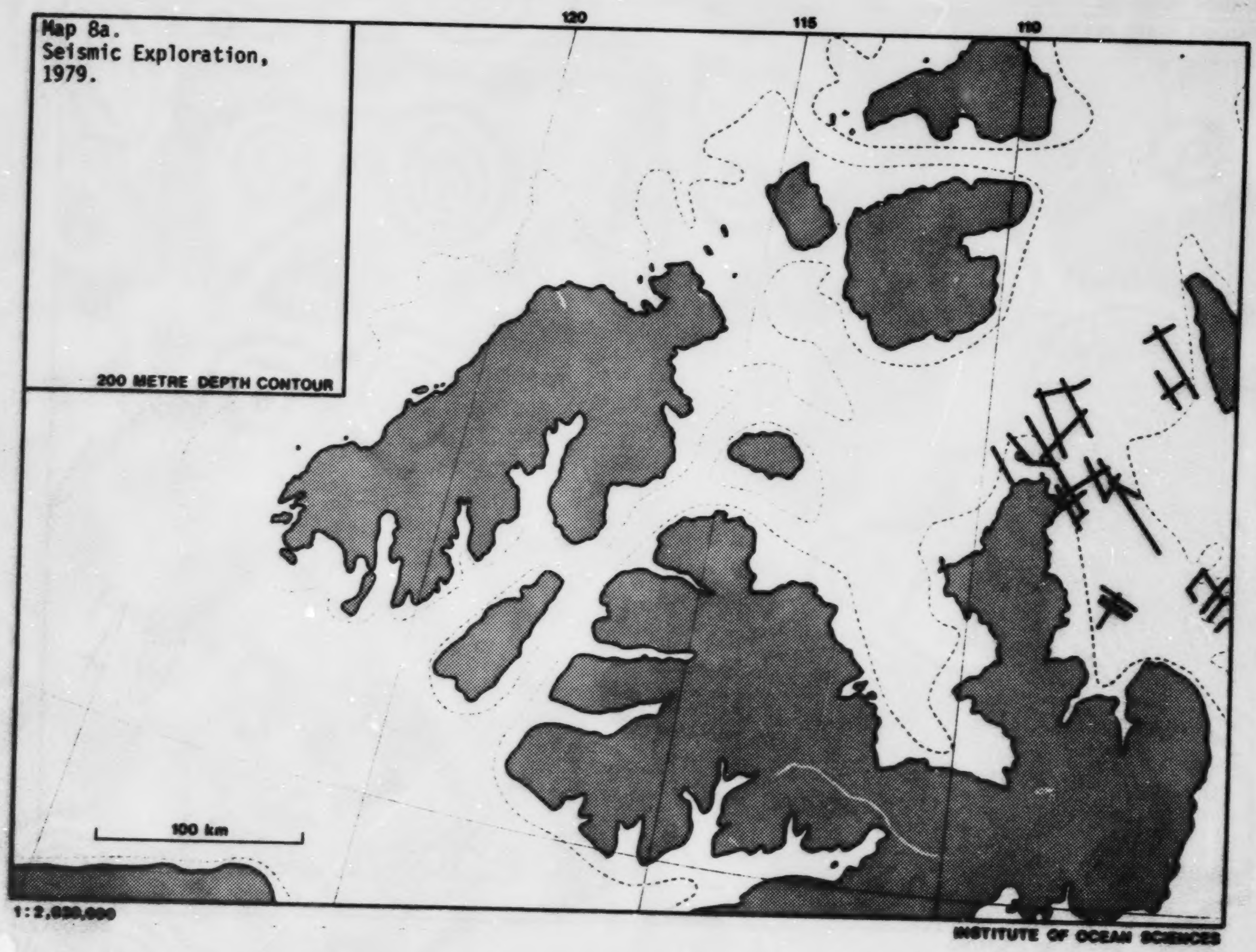


Map 7a.
Seismic Exploration,
1978.

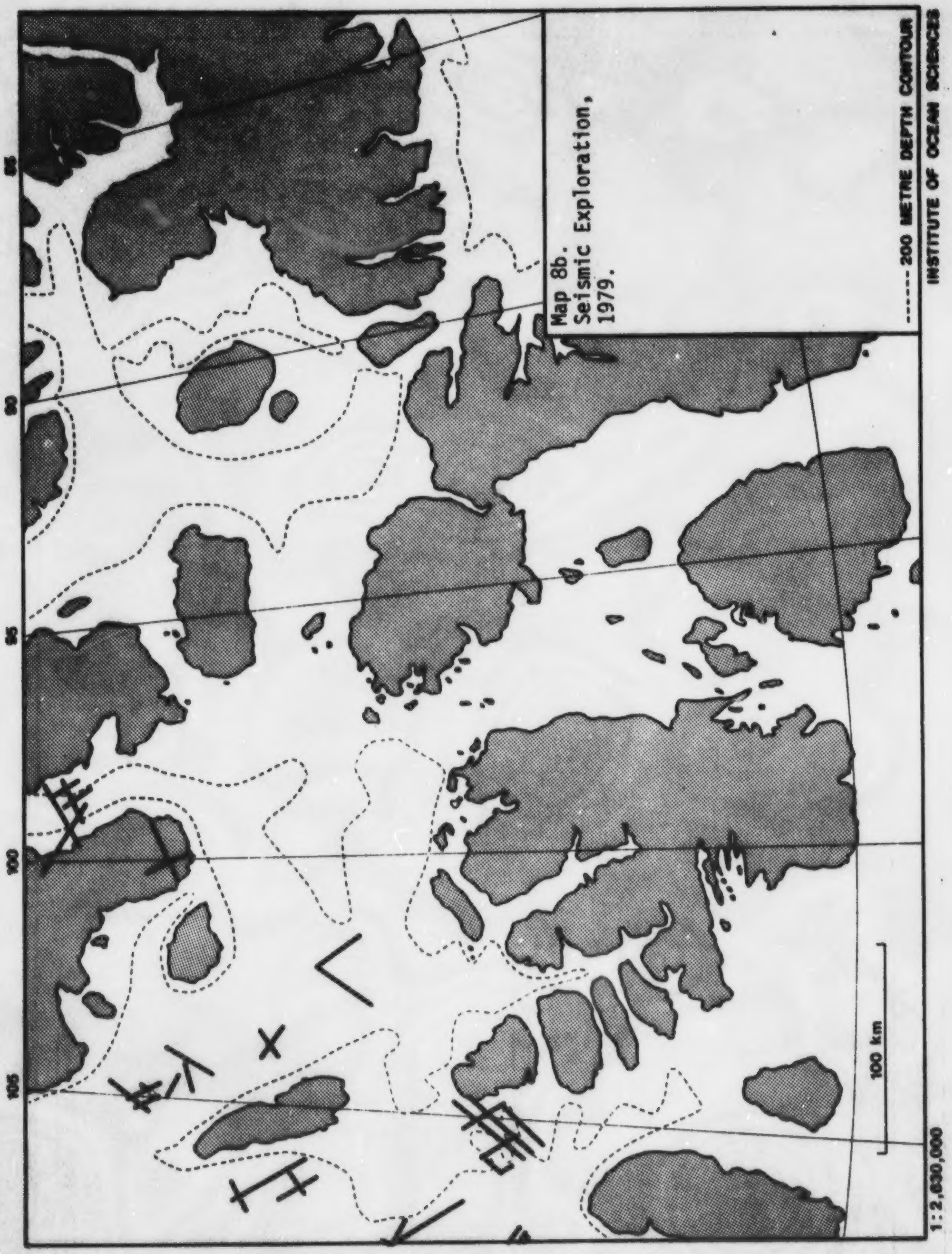

Map 7b.
Seismic Exploration,
1978.



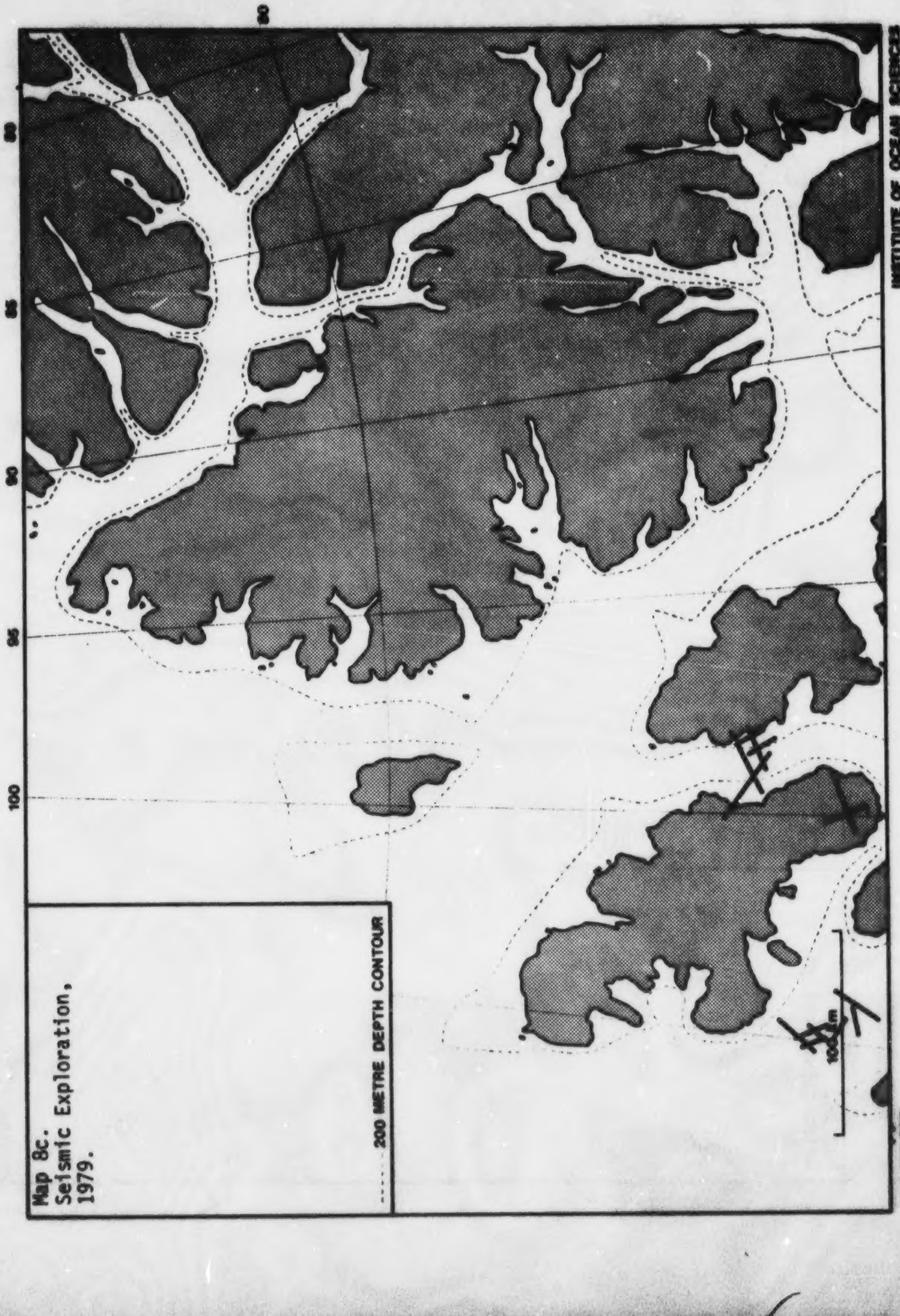
Map 7c.
Seismic Exploration,
1978.



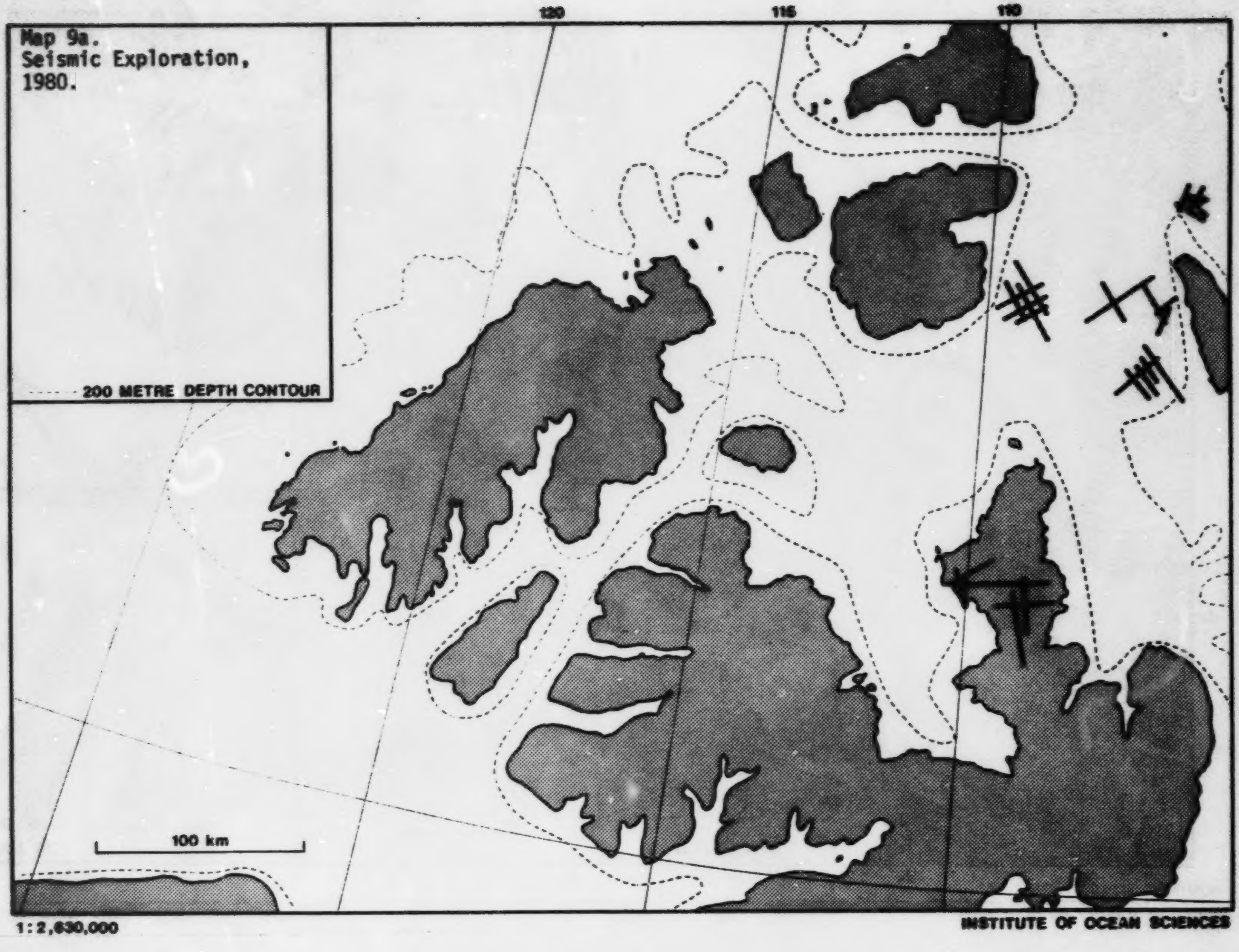
Map 8a.
Seismic Exploration,
1979.



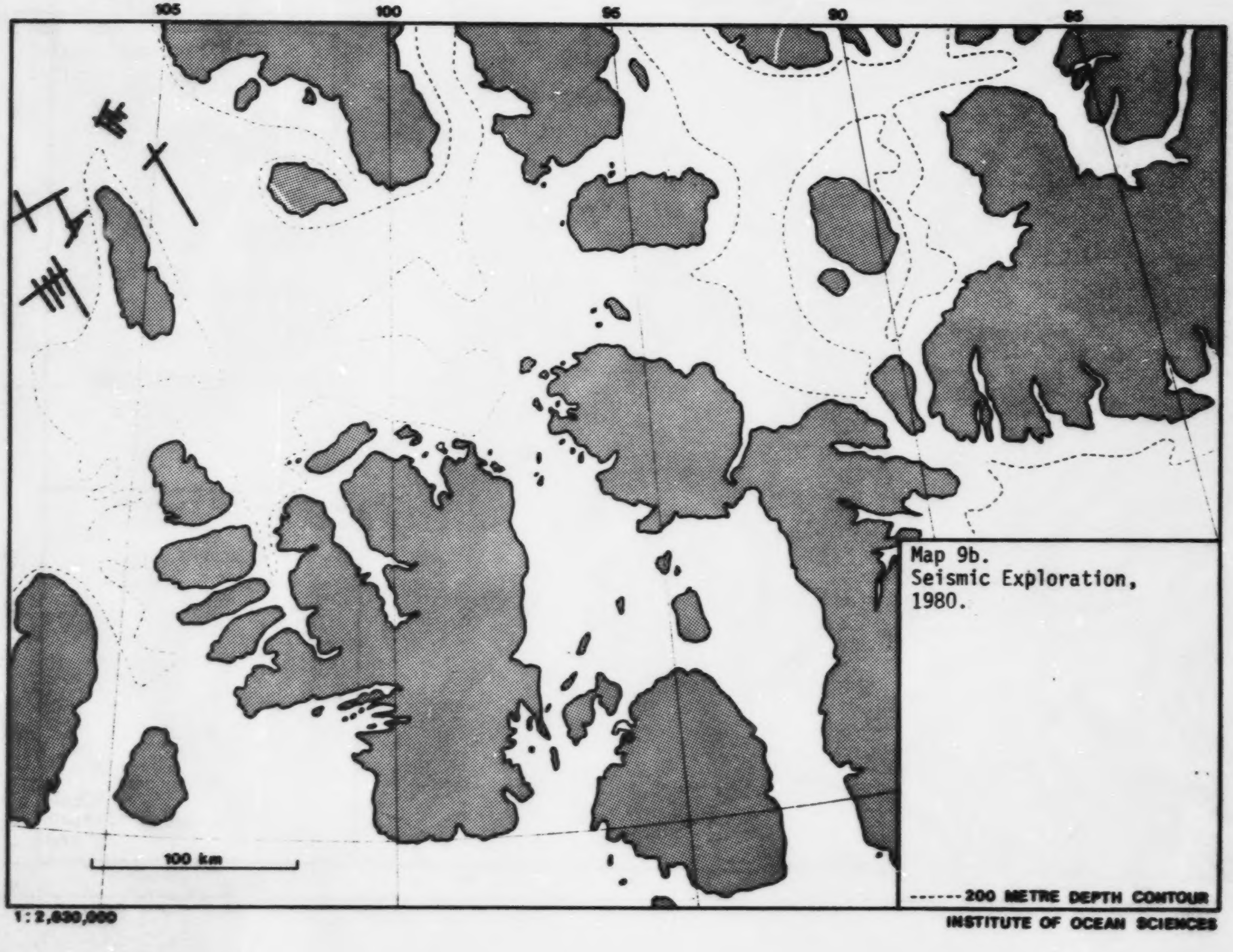
Map 8b.
Seismic Exploration,
1979.



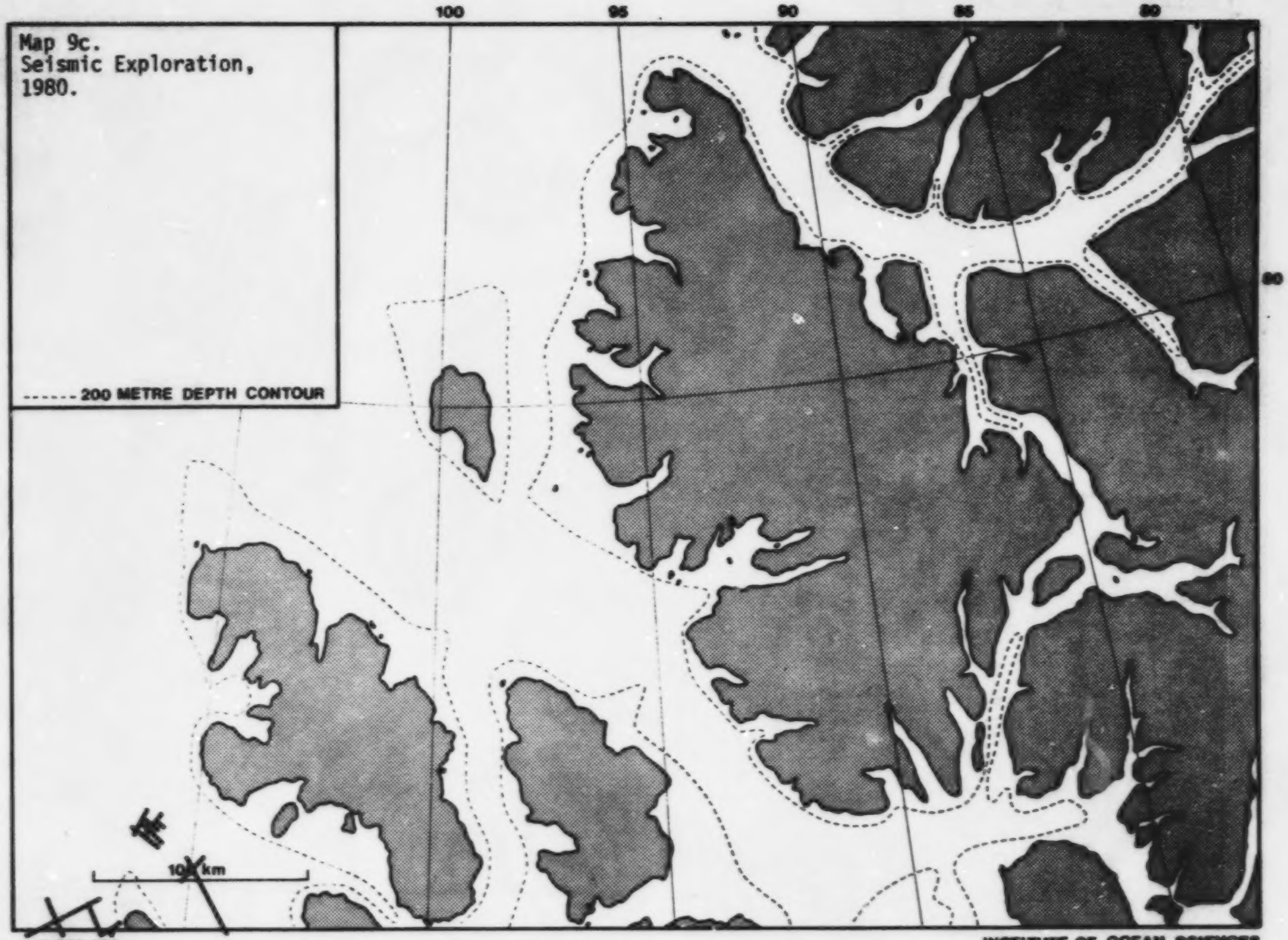
Map 8c.
Seismic Exploration,
1979.



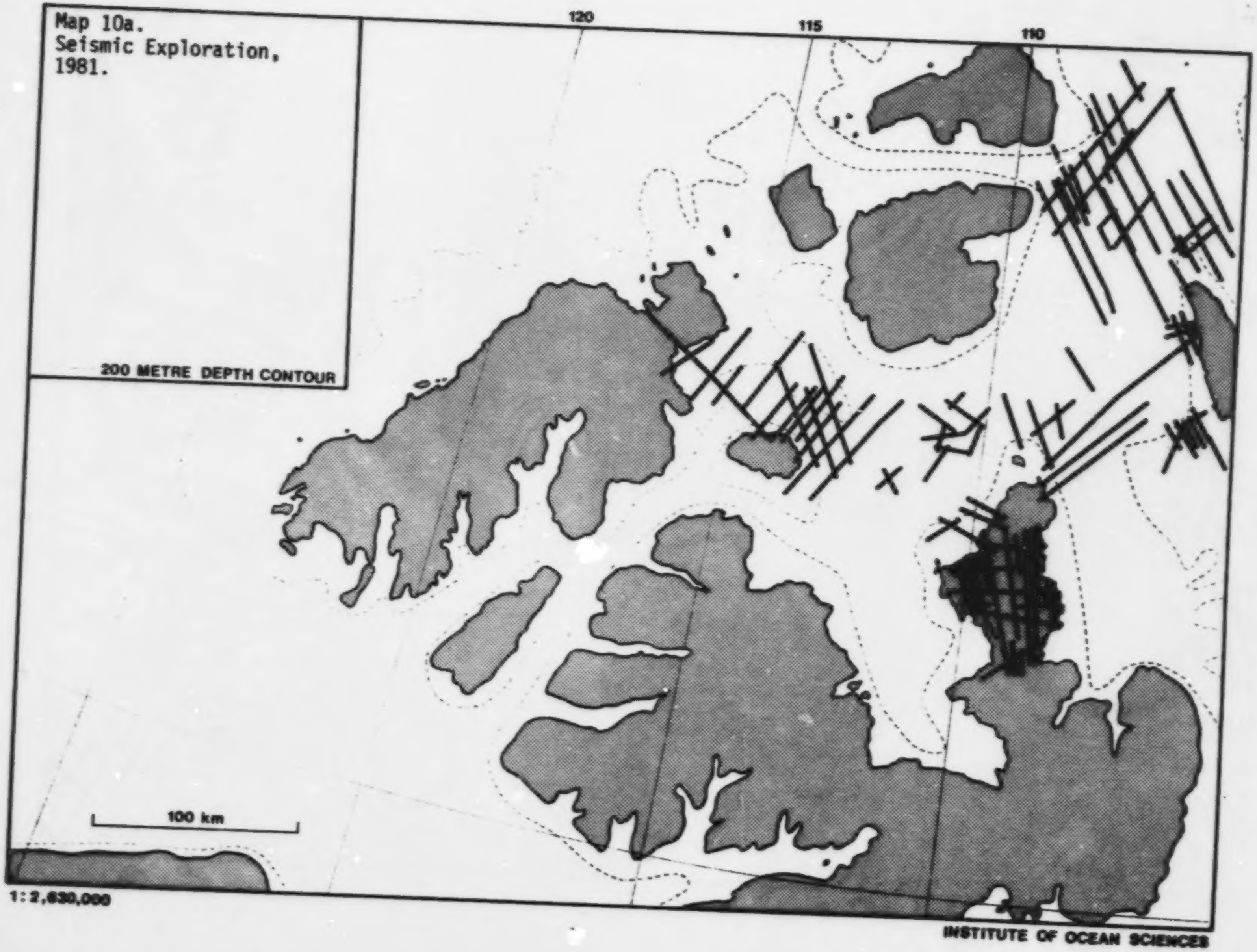
Map 9a.
Seismic Exploration,
1980.



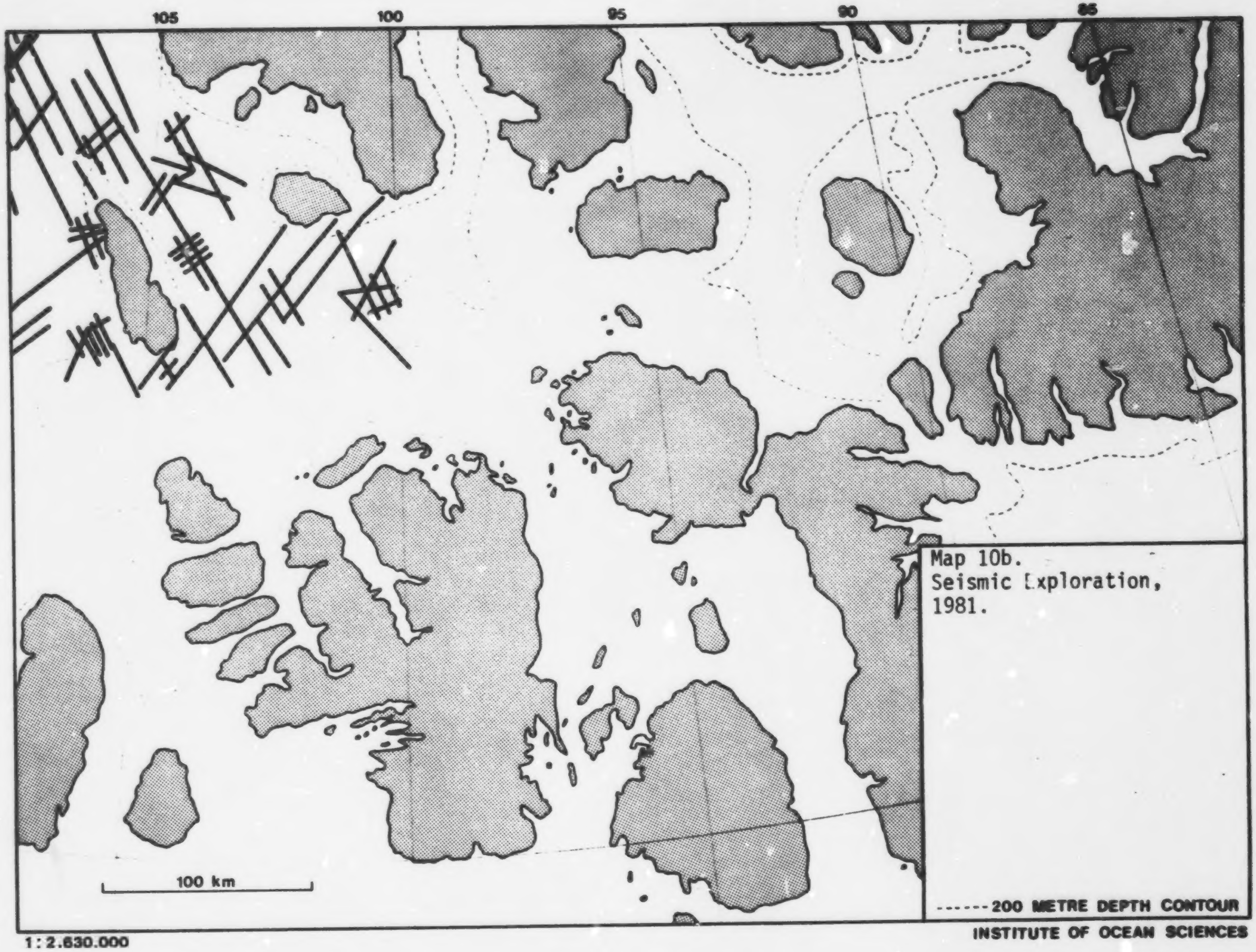
Map 9b.
Seismic Exploration,
1980.



Map 9c.
Seismic Exploration,
1980.



Map 10a.
Seismic Exploration,
1981.



Map 10b.
Seismic Exploration,
1981.

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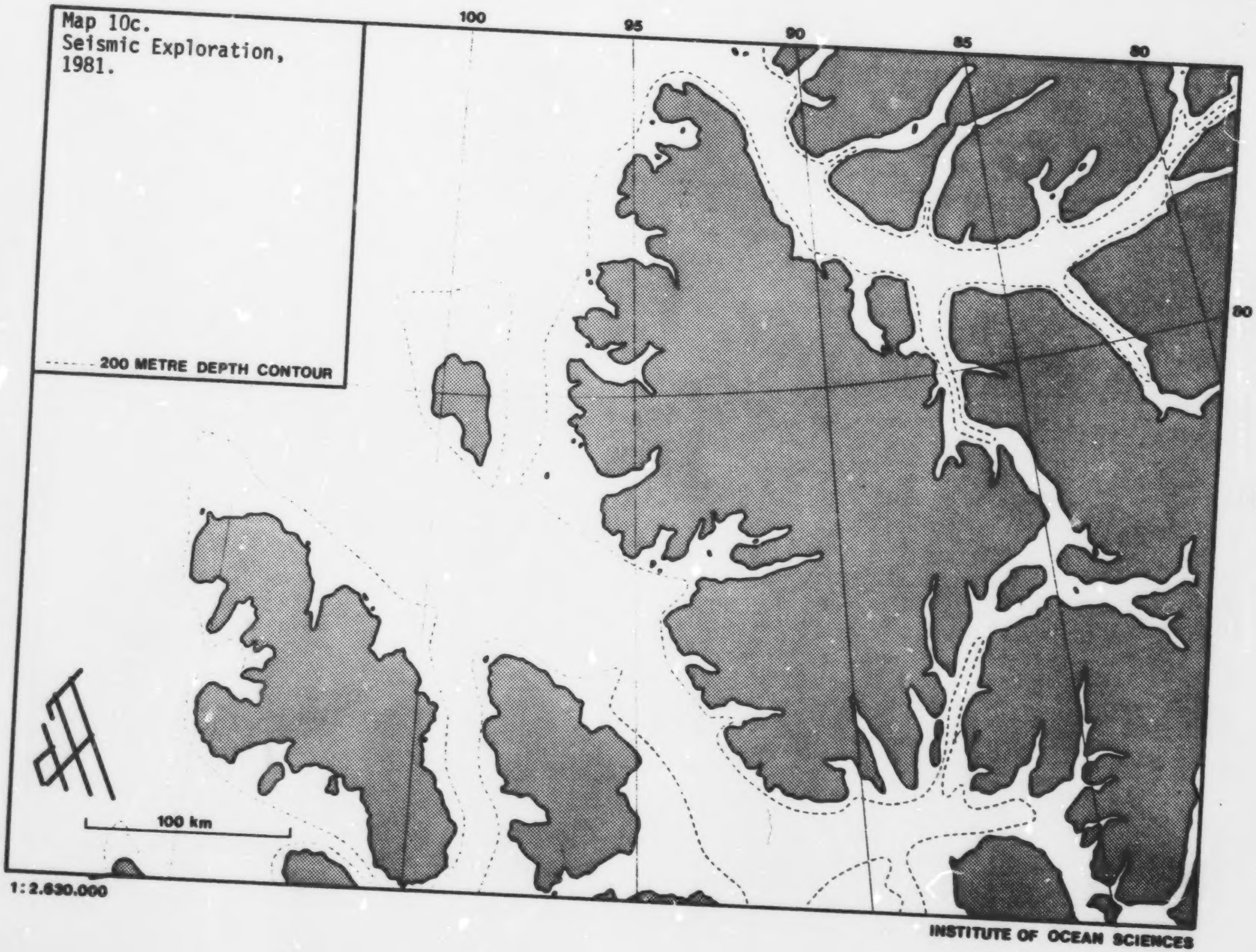
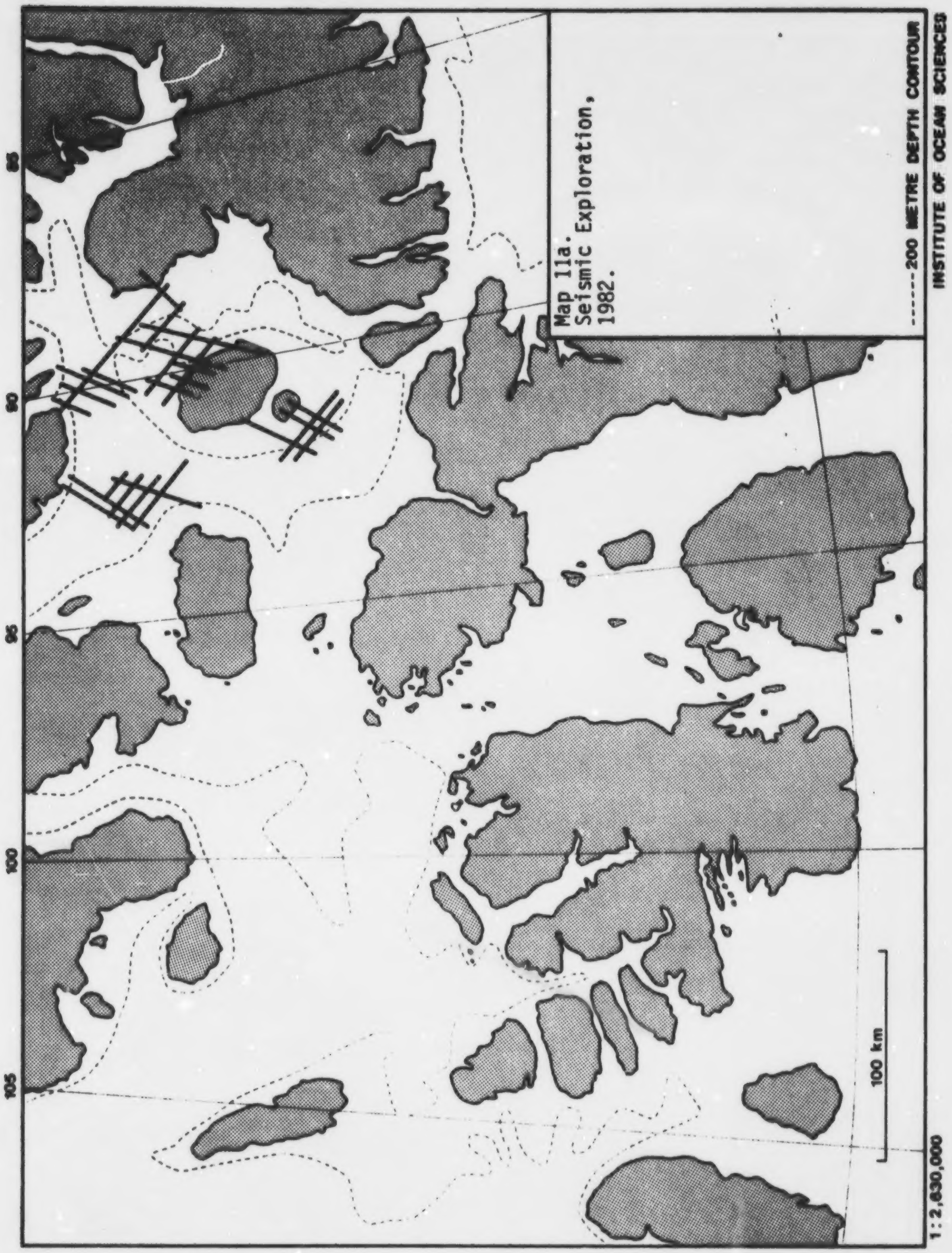
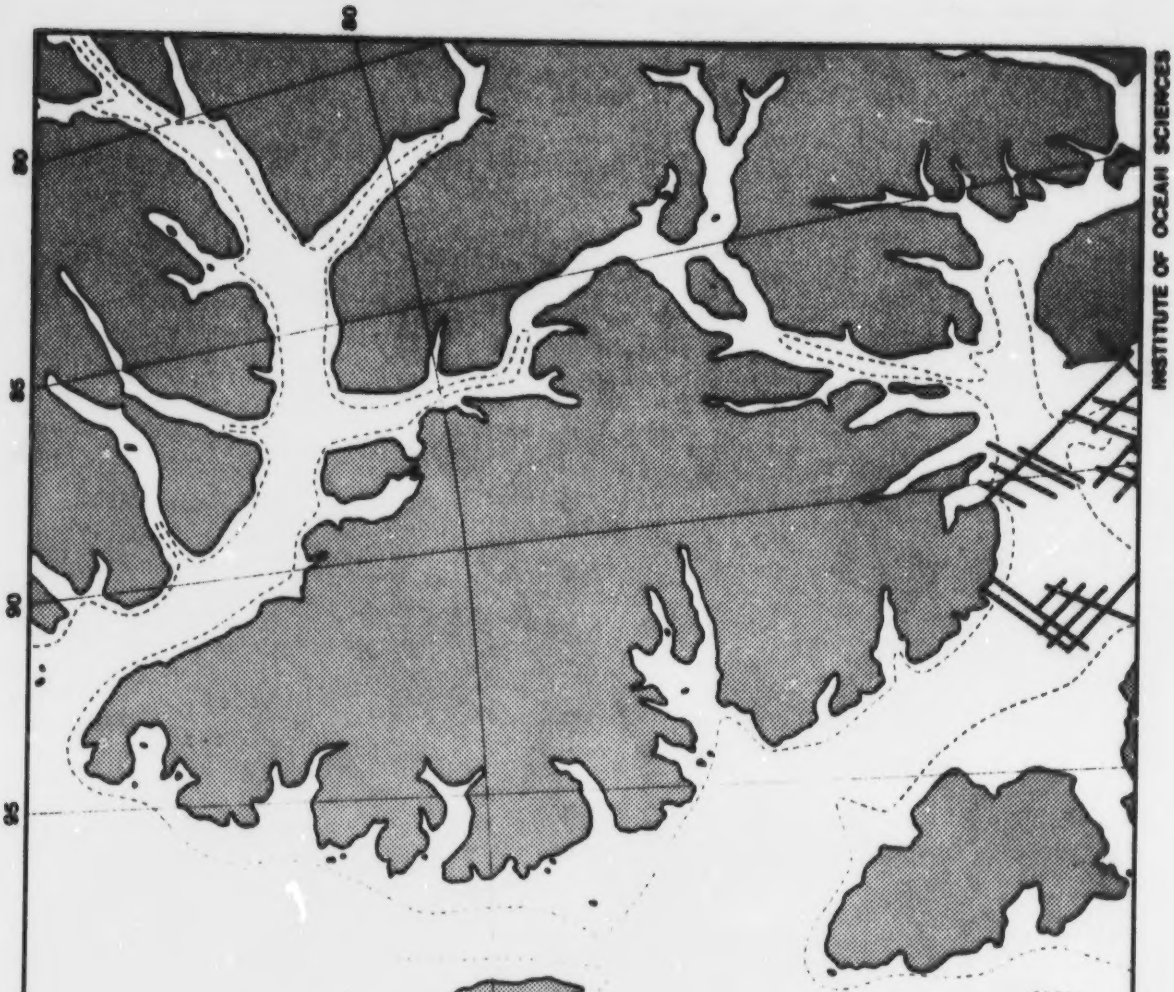
Map 10c.
Seismic Exploration,
1981.

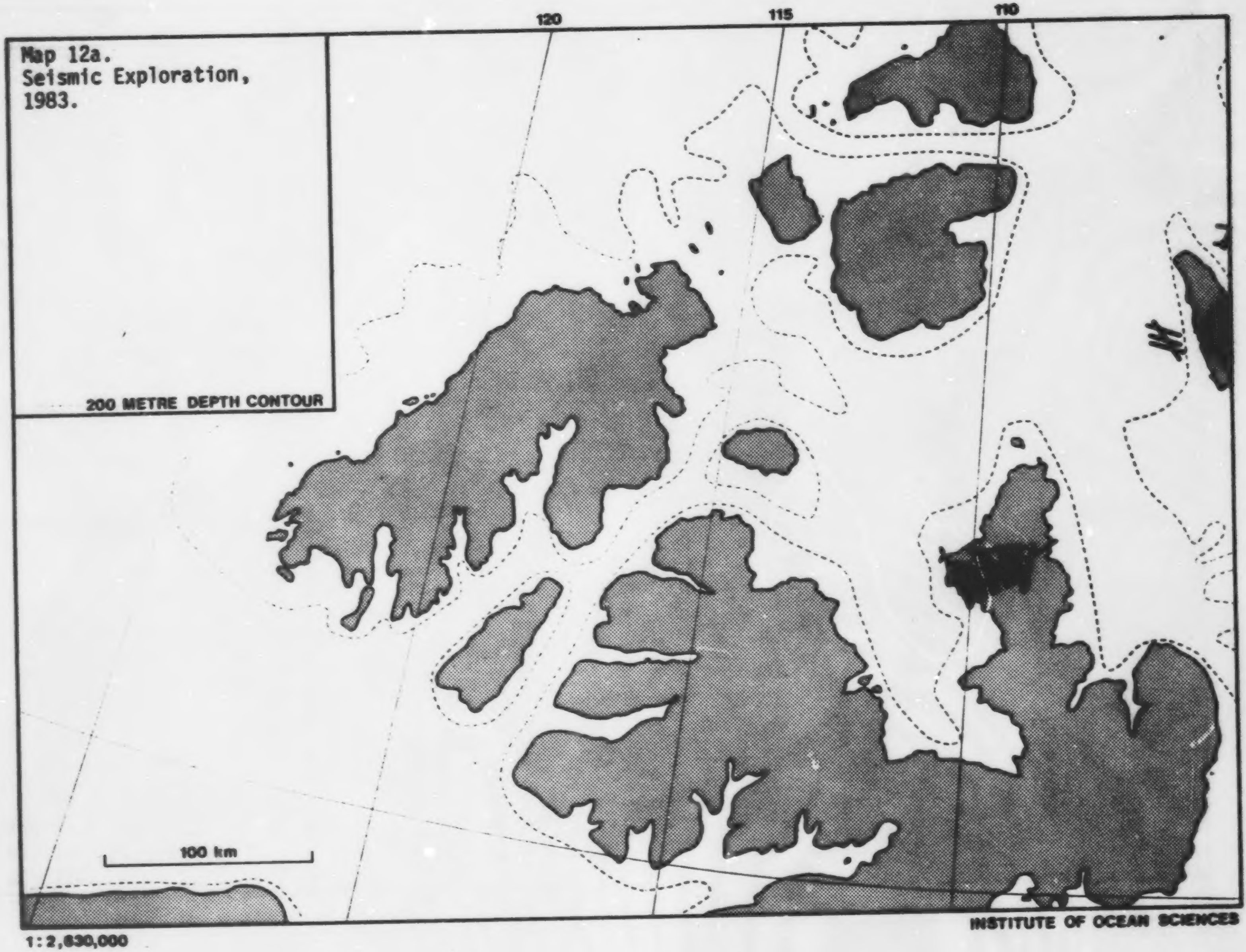




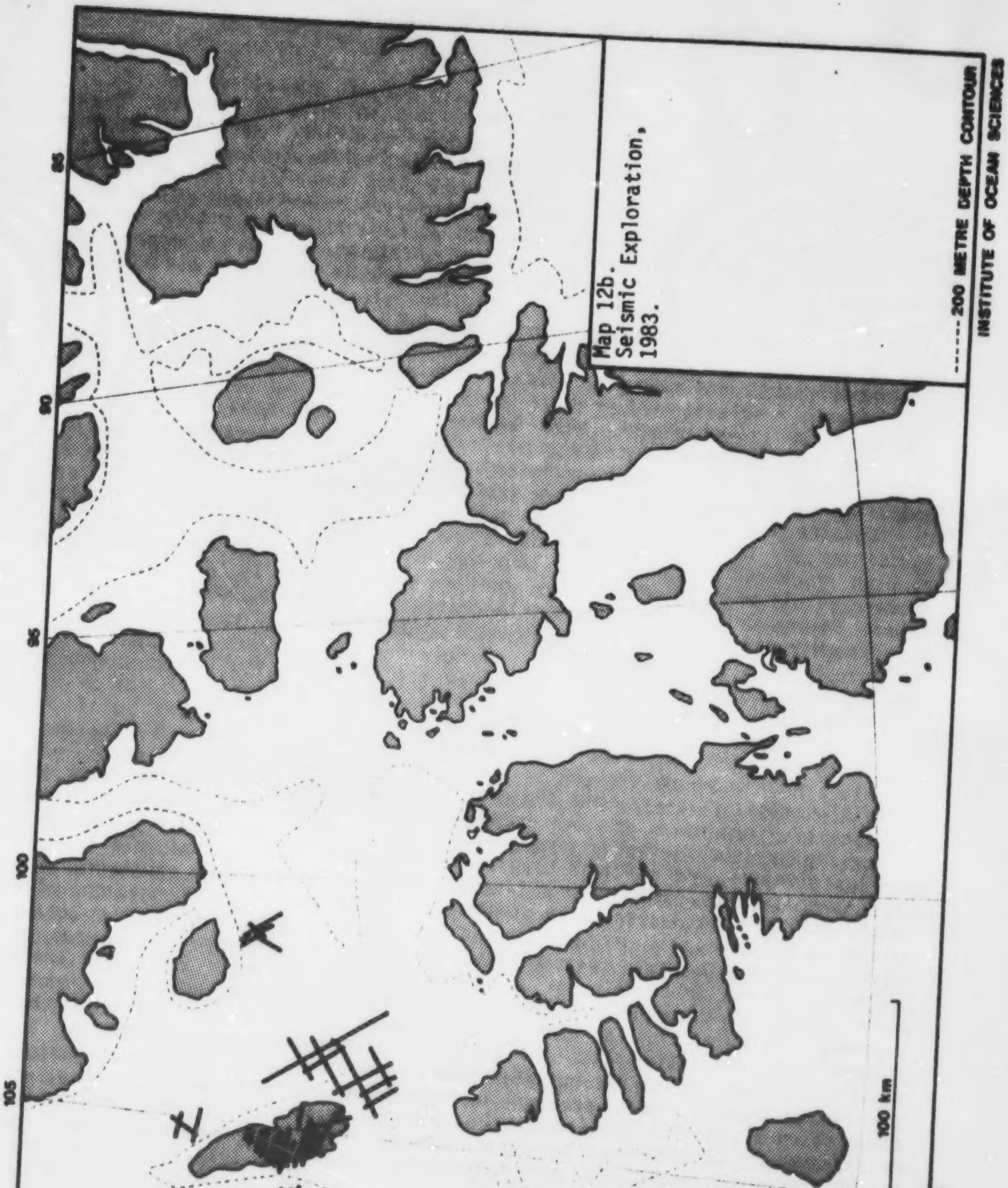
Map 11a.
Seismic Exploration,
1982.



Map 11b.
Seismic Exploration,
1982.



Map 12a.
Seismic Exploration,
1983.



Map 12b.
Seismic Exploration,
1983.

5. HYDROCARBON EXPLORATION AND DELINEATION DRILLING

5.1 Introduction

Exploration and delineation drilling in the Sverdrup Basin began in 1961 when Dome Petroleum drilled the first well near Winter Harbour, Melville Island. Since then, 136 wells have been drilled north of the 75th parallel, 80 of these being completed between January 1974 and June 1984. Drilling during this past decade can claim a measure of success with the discovery of potentially-commercial oil and gas reserves at Cameron Island and the offshore Cisco location, oil or gas discoveries of undetermined size at eight other locations, and the successful extension of the Hecla and Drake gas fields in the vicinity of Sabine Peninsula, Melville Island. As well, significant advances in logistics, drilling techniques, and production equipment have been made in response to uniquely-difficult working conditions. The development of air-transportable drilling rigs and artificially-strengthened ice platforms, for example, allowed exploration and delineation drilling at offshore locations, while refinements to a bottom-founded, subsea-blowout prevention stack and the successful testing of an experimental subsea gas production system at Drake Point F-76 wellsite, gave evidence of the potential for producing natural gas from offshore Sverdrup Basin wells.

Despite the promise of these achievements, the intensity of drilling activities and the number of petroleum operators have declined, in part, due to high risks and operating costs and the uncertain prospects for delivery of commercial oil and gas reserves to southern markets. It is uncertain whether or not future drilling activity will continue at present levels in light of the expenditures involved and the indeterminate future of commercial oil and gas production.

5.2 Field procedures

5.2.1 Timing of well starts and operations

The timing of well starts and drilling operations reflects the onset and duration of freezeup in the Sverdrup Basin. Movement of rig components, rig set-up, and resupply of operating rigs can only be carried out when land and sea ice surfaces are sufficiently frozen to support surface vehicle traffic and heavy aircraft landings or, in the case of offshore ice platforms, the weight of the rig and associated structures. Overland vehicular movement of a drilling rig is slowed or made more difficult by the thawing of the active layer. Airlift of rig components or supplies to an onshore site can be curtailed by the instability of a thawed airstrip surface. Even with these constraints, some onshore rigs continue operations through the summer. However, offshore rigs situated on ice platforms are not afforded that option. The stability of an ice platform is dependent on the thickness and structural integrity of the built-up (water-flooded) ice. Offshore operations are restricted to those periods when melting and subsequent cracking or deformation of the ice platform will not occur. Thus, offshore operations do not commence until well after the onset of freezing temperatures and are terminated in advance of the expected thawing period.

5.2.1.1 Well starts

Onshore wells are started frequently in May, prior to the onset of the summer thaw, or in October, after land surfaces have refrozen (Figure 6). No onshore wells start in the summer months of July and August when the active tundra layer has normally thawed. Of note was the steady decline in the number of well starts between December and March, perhaps reflecting operators' avoidance of the darkest and coldest season.

Offshore well drilling from built-up ice platforms is spudded almost exclusively during the months of January, February, and March. There is a dearth of offshore well starts between the onset of sea ice freezing in late September of each year and the first three months of the subsequent new year. Two factors explain this: 1) approximately 30 to 45 days are required from the onset of freeze-up for sea ice to become sufficiently stable to support surface vehicle movement to the wellsite and to allow vehicle use during ice platform construction; and 2) six to 10 weeks are necessary to construct the ice platform and set up the rig before drilling can commence. Offshore wells are usually not spudded after March to allow the well to be tested and completed and the rig dismantled before the onset of thawing temperatures. The sole exception was the relatively shallow Panarctic et al. S.W. Hecla C-58 well which was started and completed during April 1977.

5.2.1.2 Drilling operations

The overall number of operating wells shows a marked seasonal pattern, steadily increasing from October to a maximum in March and April, and thereafter, decreasing to a minimum in September (Figure 7). The preponderance of offshore drilling occurs in the first four months of the year due to the constraints posed by the time required for construction of the ice platforms and to remove a rig from an offshore location prior to sea ice thawing. In contrast, onshore drilling occurs throughout the year, although the greatest number of wells were drilled in May and December. This bi-modal pattern reflects, in part, the tendency by operators to begin onshore drilling after tundra freeze-up in late September and to continue drilling into December or January, after which time the rig is dismantled and moved to a second location to drill from April to July. Unlike offshore drilling from ice platforms, onshore drilling rigs can operate throughout the summer even after the active layer has thawed. However, the logistic difficulties brought about by the thawing of airstrips or overland resupply routes has encouraged operators to schedule drilling for the cold months between October and July.

5.2.2 Rig movement and wellsite access

Drill rigs and related equipment are transported from staging areas to new well locations using surface vehicles, fixed-wing aircraft, and/or helicopters. The choice of transport depends on the distance between the staging area and the wellsite and, if the wellsite is offshore, the ruggedness of the intervening ice cover. Surface movements are favored if the distance between the staging area and the wellsite is less than 250 km. If the wellsite is offshore, over-ice transport is only undertaken if relatively smooth, multi-year ice is present to permit easy travel of the vehicles (B. Dales, Panarctic, pers. comm., 1984). For distances greater than 250 km or

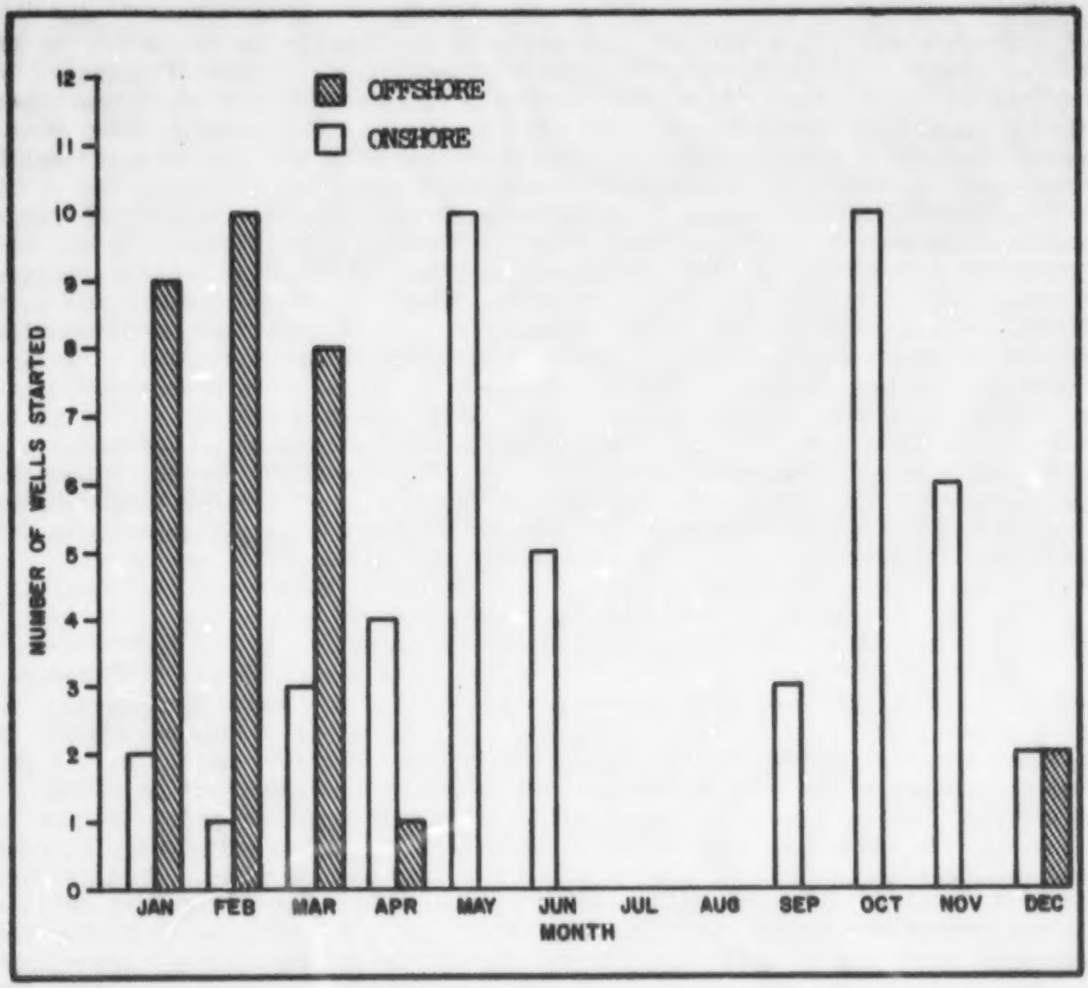


Figure 6. Onshore and Offshore Well Starts by Month Between January 1974 and June 1984.

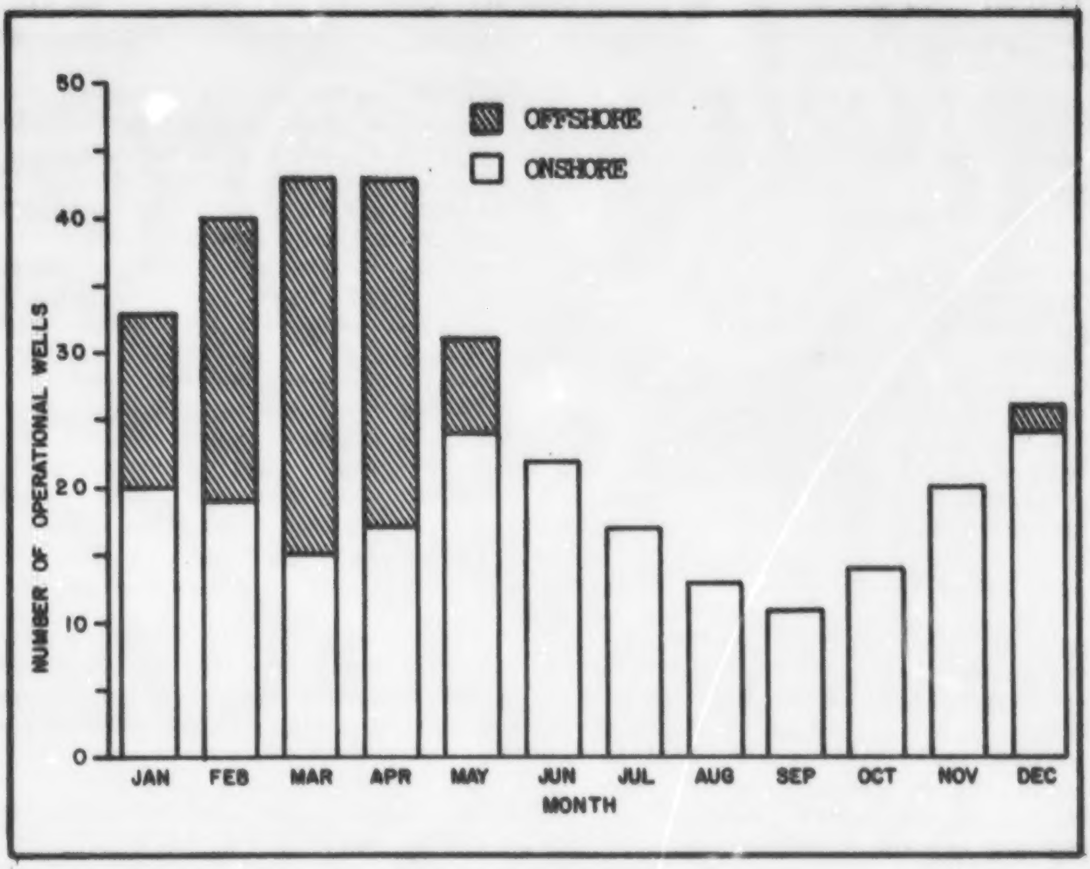


Figure 7. Sverdrup Basin Exploratory and Delineation Wells Drilled by Month from January 1974 to June 1984.

when sea ice conditions will not permit over-ice travel, drilling rigs and equipment are transported by aircraft.

Both air and ground transport of rigs, equipment, and supplies is carried out from October to May when sea and land are frozen. During summer months, potential terrain disturbances and broken ice preclude surface vehicle movement, and the thawing of onshore airstrips limits air transport to light aircraft or helicopters. Offshore wellsites are normally completed and evacuated in April or May.

For offshore wellsites, heavy-lift helicopters are used to transport camp units, D-4 Caterpillar tractors, pumps, and other support equipment to the location prior to either surface or air transport of actual rig components.

Surface transport of modular rig components is usually accomplished using a single train of two to four, 27 tonne Foremost Delta and Kenworth oilfield trucks. D-6 and D-7 Caterpillar tractors may be employed to haul equipment on sledges. In contrast, air transport of similar rig components and sufficient equipment and supplies to commence operations requires 130 to 170 Hercules aircraft loads delivered over a period of 25 to 30 days. An additional 100 to 150 flights of heavy aircraft are necessary during drilling operations; these consist of a weekly visit by a Boeing 737 for crew changes and food deliveries and a Hercules flight every second day with fuel and other consumable items for drilling. Heavy aircraft flights are supplemented with one or more daily Twin Otter flights carrying crew and light equipment. During summer months when onshore airstrips have thawed, equipment and supplies are transported to the wellsite by STOL Twin Otter and heavy-lift helicopter (Franklin, 1982).

5.3 Offshore drilling systems

Although exploration and delineation has occurred in the Sverdrup Basin since 1961, offshore drilling commenced in 1973 when four stratigraphic test wells were drilled at Kristoffer Bay, Ellef Ringnes Island. This 12-year delay in instituting offshore drilling was due primarily to the inability of conventional drilling platforms to operate from the thick, persistent sea ice found in the Region. After the first operational test of the concept at Kristoffer Bay, an artificially-thickened ice platform was used the following year to support a heavier, conventional exploration drilling rig at the Hecla N-52 wellsite. This established the feasibility of ice platform use for offshore drilling operations. Since that time, 30 offshore exploration and delineation wells were drilled from such ice platforms. In addition, one experimental, natural gas well completion was carried out at the offshore Drake F-76 wellsite. These successes suggest that similar systems will continue to be used in future offshore drilling and well completions.

5.3.1 Ice platform construction

Initial site preparation begins in late October or early November, as soon as the sea ice is thick enough to support platform construction equipment. After establishing a work camp at the wellsite, D-4 Caterpillar tractors equipped with drill towers, hydraulic pumps, and scraper blades are airlifted by heavy-lift helicopter and begin to prepare the airstrip and ice platform. Both sites are scraped smooth and further smoothed by some flooding with sea water pumped from beneath the sea ice.

Before actual platform construction begins, the platform site is surveyed to determine locations of rig equipment and workshops, placement of strain gauges, freeboard meters, oceanographic recording equipment, and orientation of overall rig loads (Figure 8). Ice thickness along the perpendicular axes of the platform site is measured to determine the amount of built-up ice required to meet stresses in or deflection of the ice during drilling operations. Usual platform design specifications call for ice thickness of 5.0 to 6.6 m.

Airstrip and ice platform flooding begins in late November when four electric pumps, each with a pumping capacity of 2,650 litres/min., are frozen into holes drilled through the ice. Seawater is sprayed onto the sea ice surface in thin layers, building up the ice at a rate of 5 to 10 cm/day. Flooding rates greater than 5 to 10 cm/day can produce unfrozen pockets of soft water which become more saline than the surrounding ice. These saline pockets do not freeze if insulated by surrounding ice from the atmospheric temperatures, and this weakens the airstrip or ice platform. By allowing water to flow freely, the ice layers become thinner near the edges of an ice platform. As a result, a tapered cross-section is achieved with the maximum thickness at the moonpool (the point of greatest stress) and a gradual reduction to natural ice thickness about 200 m from rig centre (Figure 9).

A short distance from the wellsite, a second ice platform or "relief pad" is built at the same time as the main platform is constructed. In the event that a blowout cannot be controlled by the main rig, a second rig would be moved to the relief pad to allow emergency drilling of a relief well.

Special urethane foam blocks were used at two wellsites as an experimental means of reducing the amount of built-up ice needed to maintain freeboard. Approximately 271 m^3 of foam was incorporated into the relief pad at the Char G-07 well while 550 m^3 was used in the Maclean I-72 main ice platform (Figure 10). Results indicate the foam was indeed effective in reducing requirements for built-up ice, and hence, reduced the time needed for platform construction. However, foam blocks have not been used in subsequent platforms.

Ice temperature control is essential to maintaining the tensile properties of the ice platform. During construction, thermistor banks are placed adjacent to the moonpool and at the platform centre to ensure that the ice temperature does not rise above -5.0°C (although in practice, the temperature seldom rises beyond -10.0°C). To prevent platform thawing during drilling operations, the ice surface is insulated from the rig's heated areas by a 15 cm wooden rig matting, four sheets of polyethylene, and 5 cm of high-density polyurethene.

5.3.2 Rig configuration

The general configuration of Panarctic's offshore rigs provides a wide distribution of weight across the ice platform surface (Figure 11). The mud tanks containing a slurry of drilling muds and water are the heaviest components of the rig. Any rig layout, therefore, ensures that the mud tanks are separated from the rig substructure to minimize the weight near the moonpool, the weakest point of the ice platform. The proper distribution of weight resulting from the careful rig configuration reduces the thickness of built-up ice required and, in turn, reduces the time needed for ice platform construction. The rig layout also allows the rig substructure to be skidded in any direction to compensate for limited horizontal movements of the ice sheet beneath.

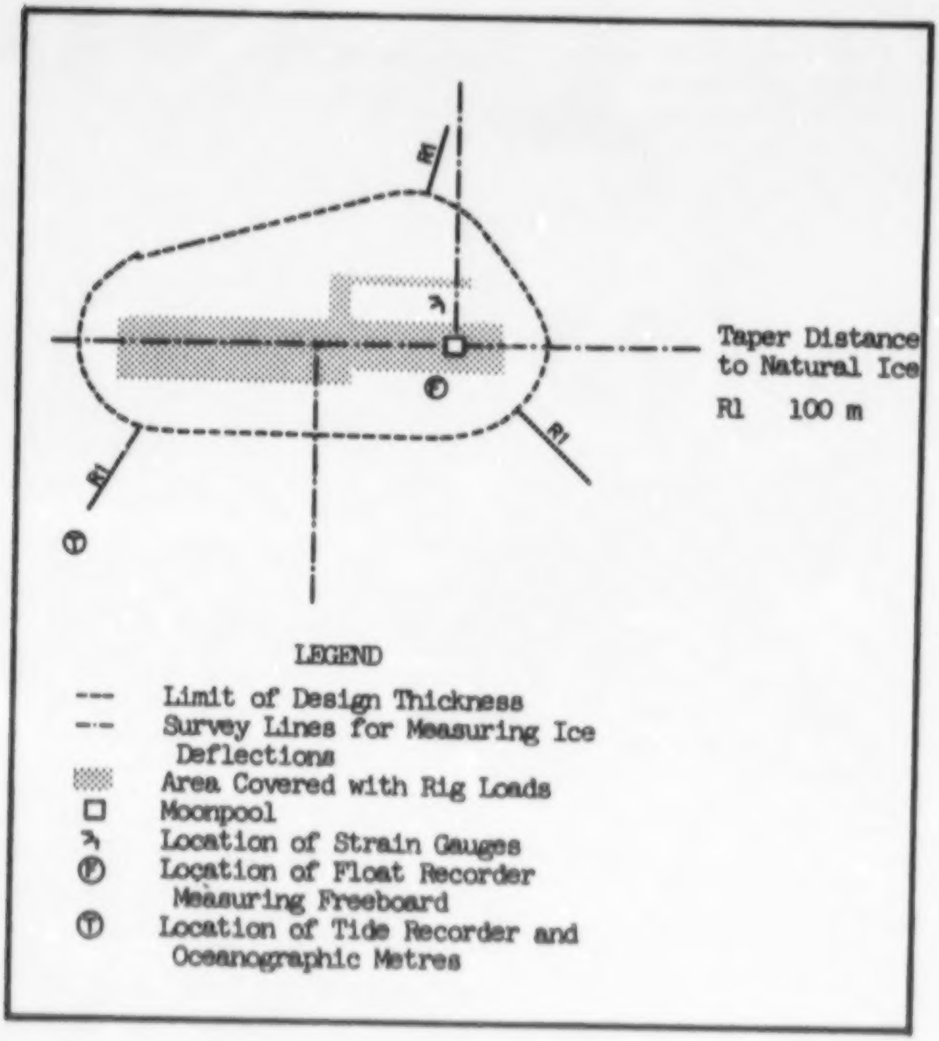

R1
Taper Distance to Natural Ice
R1 100 m
R1
R1
LEGEND
--- Limit of Design Thickness
-·- Survey Lines for Measuring Ice Deflections
▨ Area Covered with Rig Loads
☐ Moonpool
Location of Strain Gauges
Ⓕ Location of Float Recorder Measuring Freeboard
Ⓣ Location of Tide Recorder and Oceanographic Metres

Figure 8. Ice Platform Layout for Rig B.
(Adapted from Panarctic Oils Limited, 1982b)

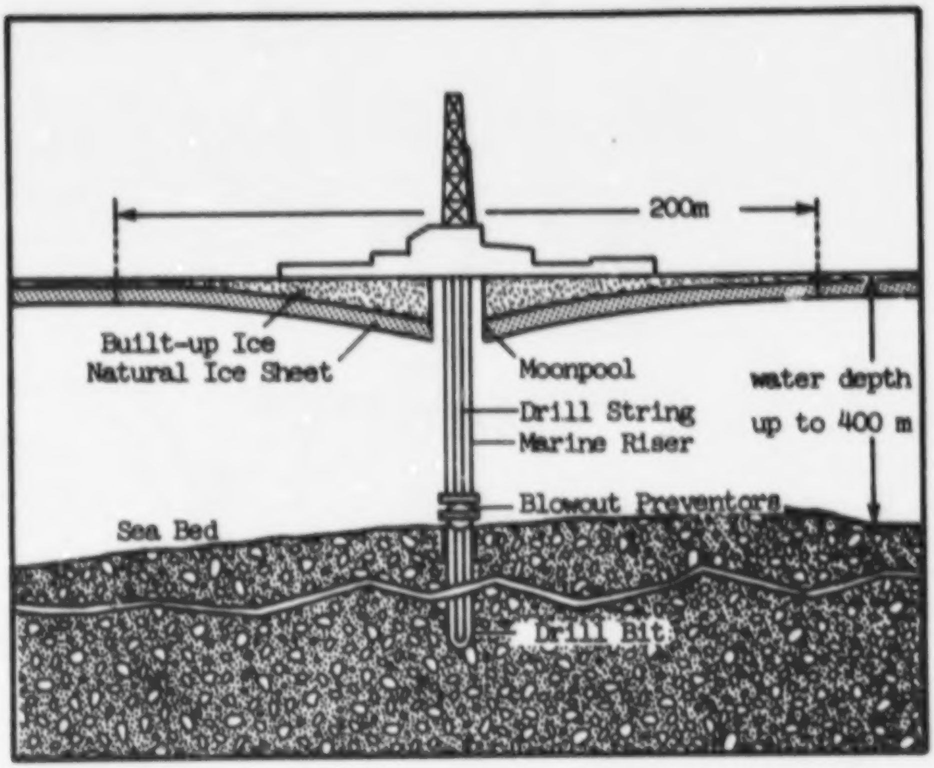


Figure 9. Section View of Ice Platform Drilling.
(Adapted from Davies, 1983/84)

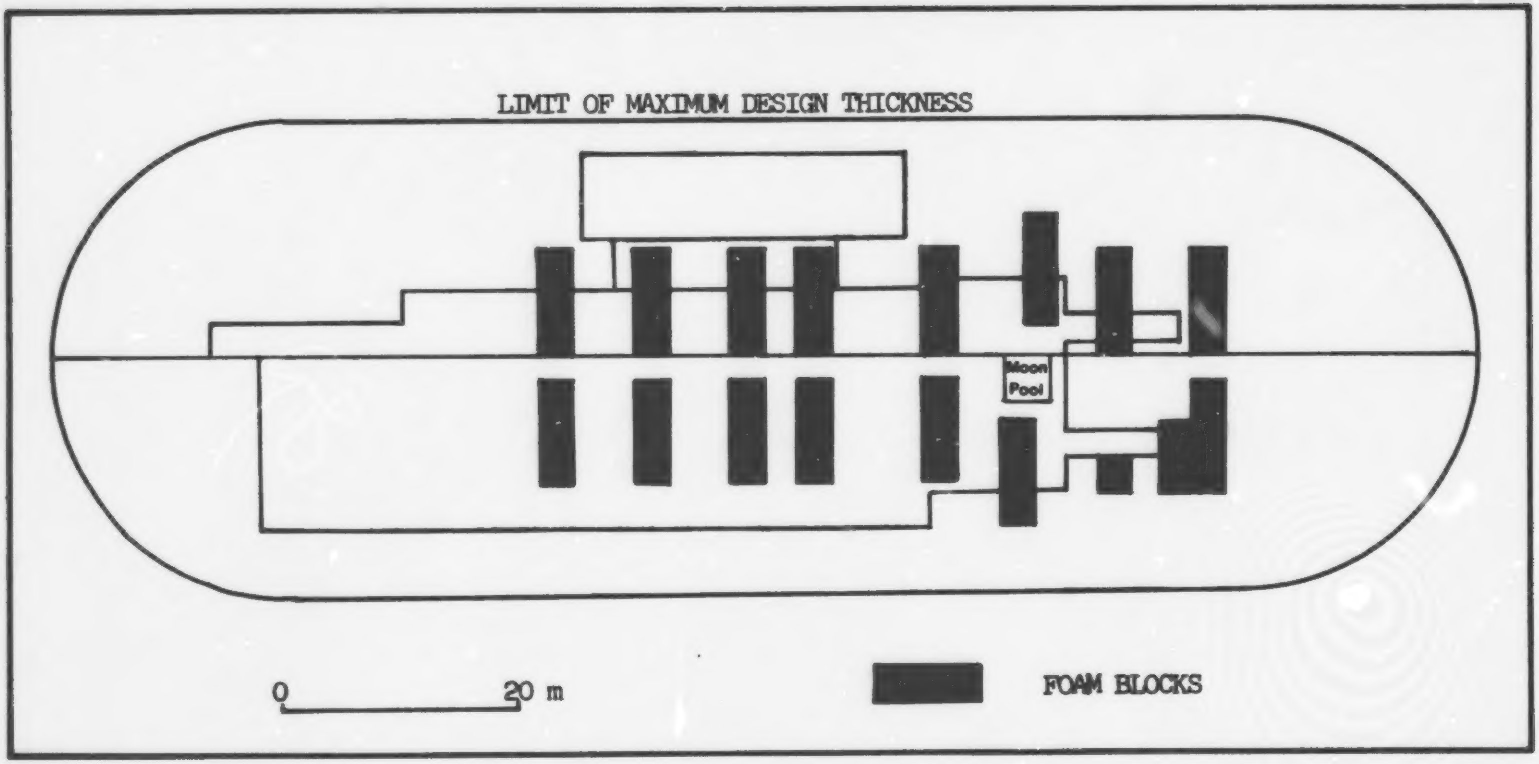
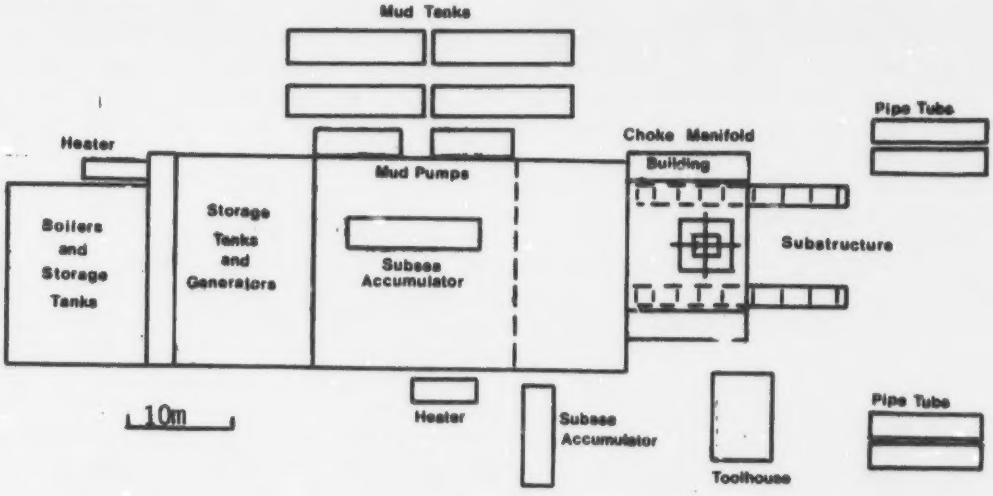
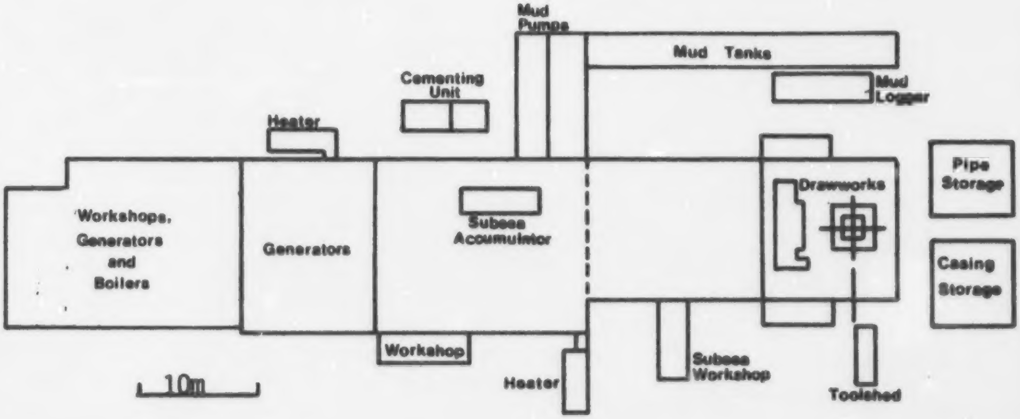


Figure 10. Foam Block Layout at Panarctic et al Maclean I-72, Pad A. (Adapted from Panarctic Oils Limited, 1980a.)



PANARCTIC RIGS "A" AND "C". (Source: Panarctic Oils Limited, 1982c).



PANARCTIC RIG "B". (Source: Panarctic Oils Limited, 1982b).

Figure 11. General Configurations of Offshore Drill Rigs.

5.3.3 Subsea blowout prevention system

Panarctic's underwater drilling system allows the use of conventional land rigs situated on ice platforms for drilling expendable exploratory wells in up to 500 m of water. A very compact subsea blowout preventer (BOP) stack was designed for use with the rig (Figure 12) to minimize the size of the moonpool and, thus, maintain buoyancy of the ice platform. Two 346 mm, 34,500 kPa pipe rams and one 346 mm, 34,500 kPa shear ram allows emergency closure of the well on the ocean floor, while excessive pressure within the annulus can be controlled with a 346 mm, 34,500 kPa annular preventer valve. Additional protection is afforded by 70 mm, 34,500 kPa fail-safe choke and kill valves within the marine riser. The BOP stack is joined to the wellhead and marine riser by two 346 mm, 34,500 kPa hydraulic connectors, which can be released by means of an acoustic control system should the main hydraulic system fail.

The BOP stack and surface rig are linked by a flexible 406 mm marine riser attached to ball joints above the annular preventer and within the diverter housing. The ball joints allow the ice platform to move horizontally to a maximum distance of seven percent of water depth without deforming the riser. Abandonment procedures are initiated if the distance exceeds seven percent.

During vertical movements of the ice platform with diurnal tides, tension is maintained on the riser by means of hydraulic cylinders suspended from the drill floor and attached to a telescoping joint. A typical 1.2 m maximum tide can be easily accommodated by the 4.6 m stroke of the joint.

5.3.4 Experimental offshore well completion, Panarctic et al. Drake F-76

As mentioned before, Panarctic Oils completed an experimental subsea natural gas production system at its Drake F-76 well in 1978. The wellsite was an ice platorm located 1,220 m off the western shore of Sabine Peninsula, Melville Island with the wellhead 55 m below ice surface (Figure 13). Ice platform construction techniques and the underwater drilling system used at Drake F-76 were similar to those used previously at other ice platforms (Palmer et al, 1979; Watts and Masterson, 1979). The production system consisted of a "Christmas tree" assembly, control system, and flowline bundle connecting the subsea wellhead to an onshore facility. The 34,500 kPa Christmas tree was made up of a production block containing two 130 mm master valves and an annulus block containing a 52 mm master valve. A 152 mm, 34,500 kPa crossover valve located beside the production block allowed "pigging" (pipe inspection) from shore down one flowline and returning through the other flowline.

The hydraulic control system consisted of two 25 mm hydraulic lines connecting a shore-based power unit and control panel with a production control pod capping the Christmas tree assembly. One line provided a pressure signal to the shore control while the second line supplied a hydraulic operating signal to the tree valves. A third 25 mm line allowed alcohol to be injected into the flowlines to prevent gas hydrate formation when flow-testing the wells.

The flowline consisted of a bundle of seven lines (Figure 14):

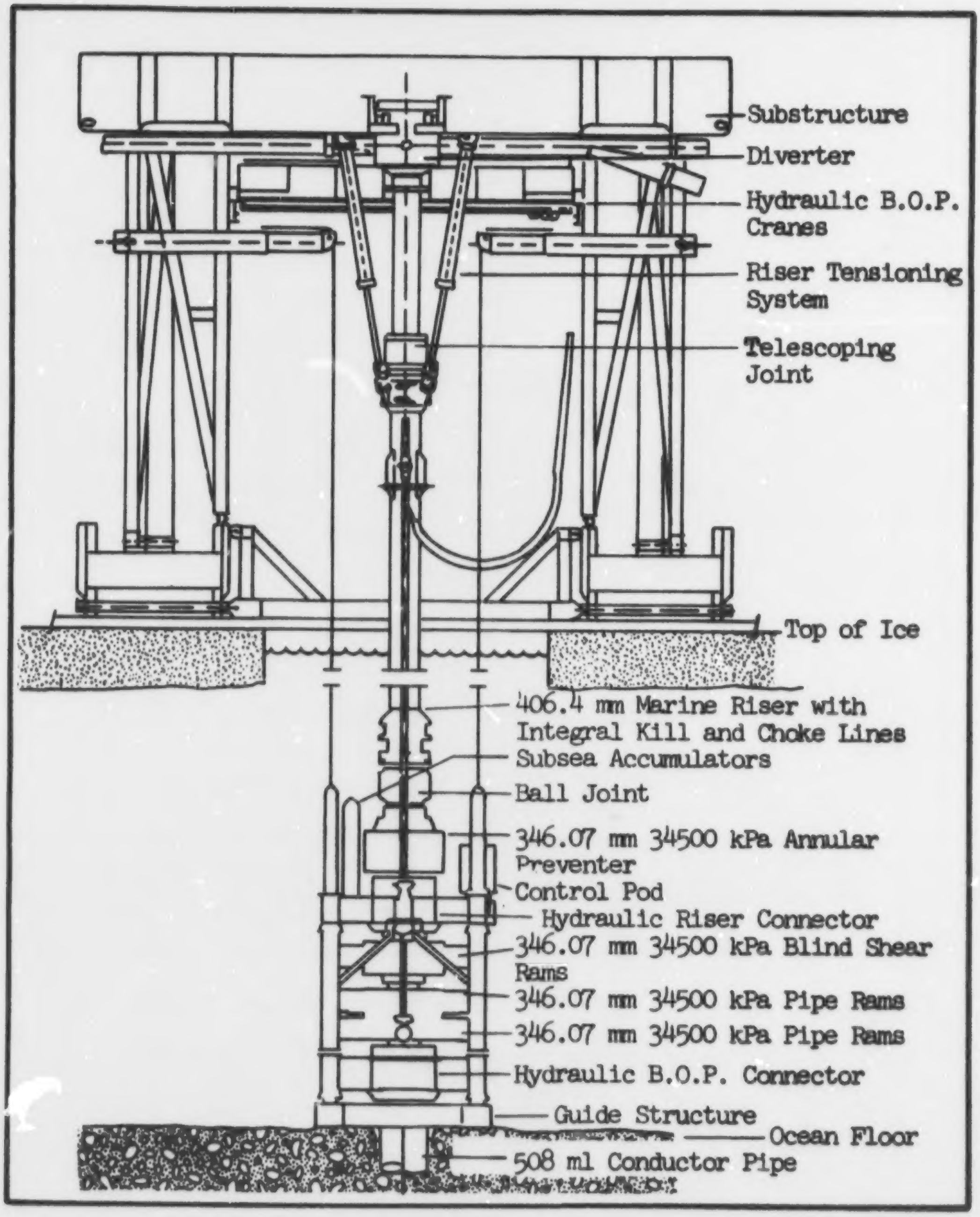

Substructure
Diverter
Hydraulic B.O.P. Cranes
Riser Tensioning System
Telescoping Joint
Top of Ice
406.4 mm Marine Riser with Integral Kill and Choke Lines
Subsea Accumulators
Ball Joint
346.07 mm 34500 kPa Annular Preventer
Control Pod
Hydraulic Riser Connector
346.07 mm 34500 kPa Blind Shear Rams
346.07 mm 34500 kPa Pipe Rams
346.07 mm 34500 kPa Pipe Rams
Hydraulic B.O.P. Connector
Guide Structure
Ocean Floor
508 ml Conductor Pipe

Figure 12. Subsea Blowout Preventer System.
(Source: Watts and Masterson, 1979)

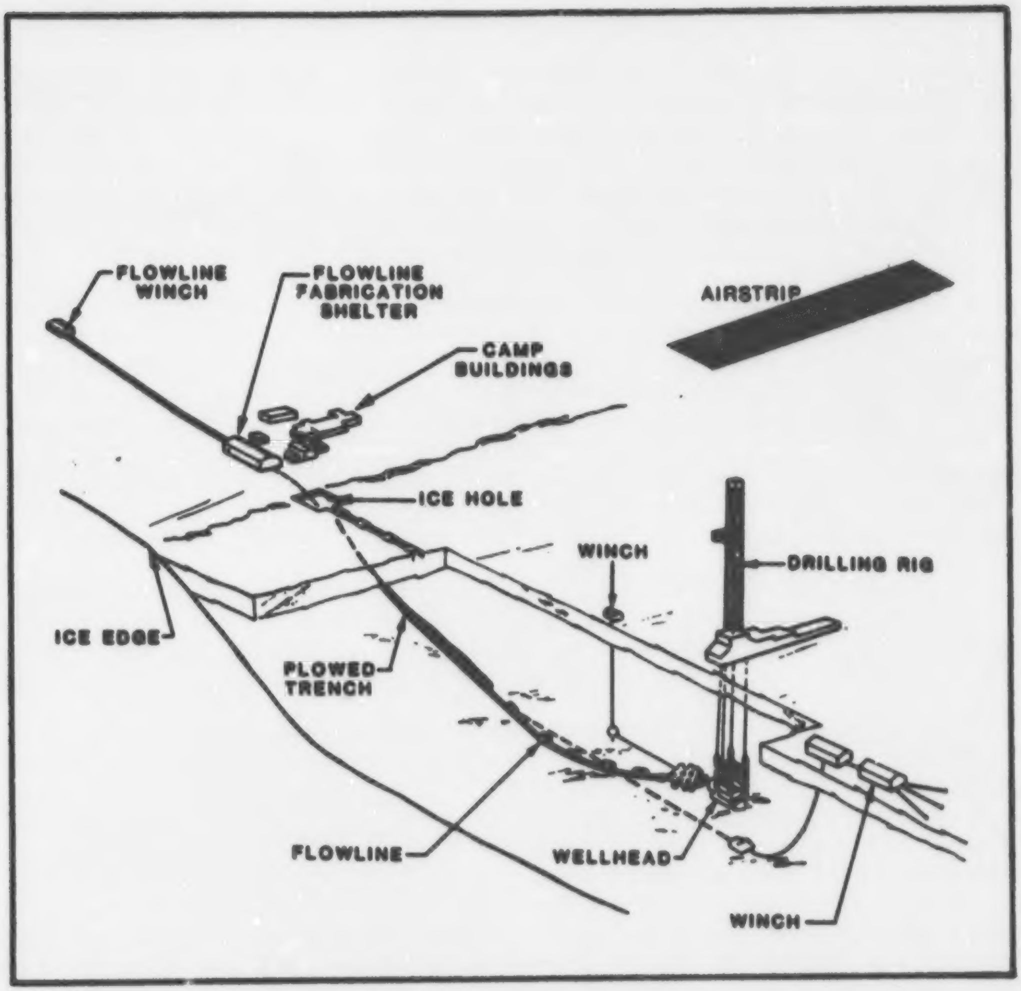
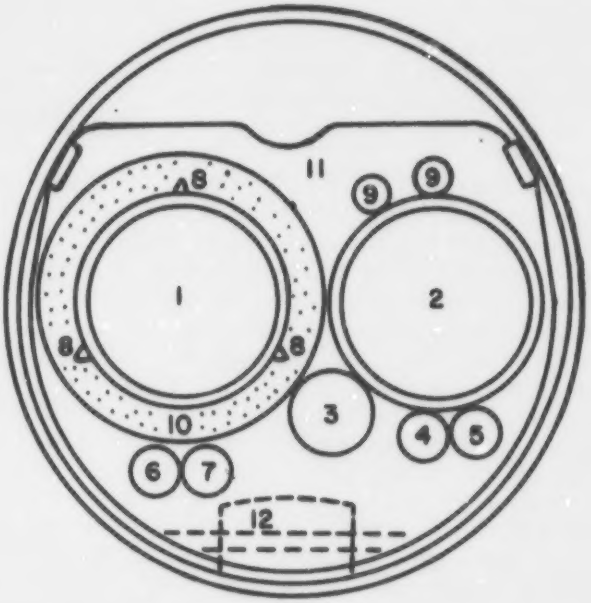


Figure 13. Panarctic Drake F-76 Experimental Subsea Natural Gas Production System.
(Source: Davies, 1983/84.)



1,2	6-inch flowlines
3	2-inch annulus line
4,5,6,7	1-inch methanol and hydraulic control lines
8	Thermon heat tracing cables
9	SECT heat tracing
10	insulation
11	spacer
12	roller

Figure 14. Flowline bundle.
(Source: Palmer et al, 1979)

a) one 152 mm insulated gas flowline with three Thermon heat tracer systems;
b) one 152 mm uninsulated gas flowline with two SECT heat tracer systems;
c) one 25 mm alcohol injection line;
d) two 25 mm hydraulic control lines;
e) one 51 mm annulus monitoring line;
f) one 25 mm spare line.

The 1,300 m bundle was fabricated and tested on shore before being loaded onto an onshore launchway in preparation for winching to the wellhead.

With the flowline completed, a continuous slot 0.3 m wide was cut through the ice from shore to the drilling platform using a chain-saw ditcher mounted on a crawler tractor. A cable from the ice platform winch was lowered into the slot and a trenching plow was attached to the winch cable. After ploughing a shallow trench, the flowline was pulled to a position adjacent to the subsea wellhead using the same winch. A coolant circulated through the flowline froze underlying sediments to enhance the stability of the flowline bed while the flowline trench was backfilled to provide some protection from possible ice scouring (Figure 15).

The completion phase of the well began with the retrieval of the marine riser and BOP stack and the placement of a protective cap on the casing head. Pull-in and flowline frames were assembled and backed together on the surface, then lowered by means of guide lines supported by the drilling rig to a well-head guide frame above the wellhead. The flowline was then pulled and locked to the flowline frame and, after confirming, by means of an underwater television monitor, that the locking mechanisms were engaged, the pull-in frame was unlocked from the flowline frame and pulled to the surface. The flowline frame, with the flowline secured to it, remained locked to the wellhead.

Having established the flowline connection between the shore and the wellhead, the protective cover was removed from the casing head. The Christmas tree valve assembly was lowered and attached to the casing head with a hydraulic connector. Connectors from the Christmas tree were hydraulically extended to join with control lines within the flowline bundle. All lines were then pressure tested preparatory to the well completion testing.

After flow-testing the well, control of the well was transferred to a shore-based hydraulic control unit. Once the hydraulic control functions were confirmed as being operative, the rig was released and dismantled. A series of production tests was conducted to determine hydrate formation characteristics, evaluate the performance of the insulated and uninsulated flowlines, and determine the effects of injecting alcohol at various rates and locations on hydrate control within the flowline. Production testing was completed on 14 May 1978, but the well continued to produce fuel gas for use at the onshore test facility and camp. The well was finally shut down on 28 November 1978 (Palmer *et al*. 1979; Watts and Masterson, 1979).

5.4 Exploration-related activities

5.4.1 Rea Point operations base

Rea Point, located on the east coast of Melville Island, is the main base of operations for Panarctic's activities in the Sverdrup Basin. Permanent

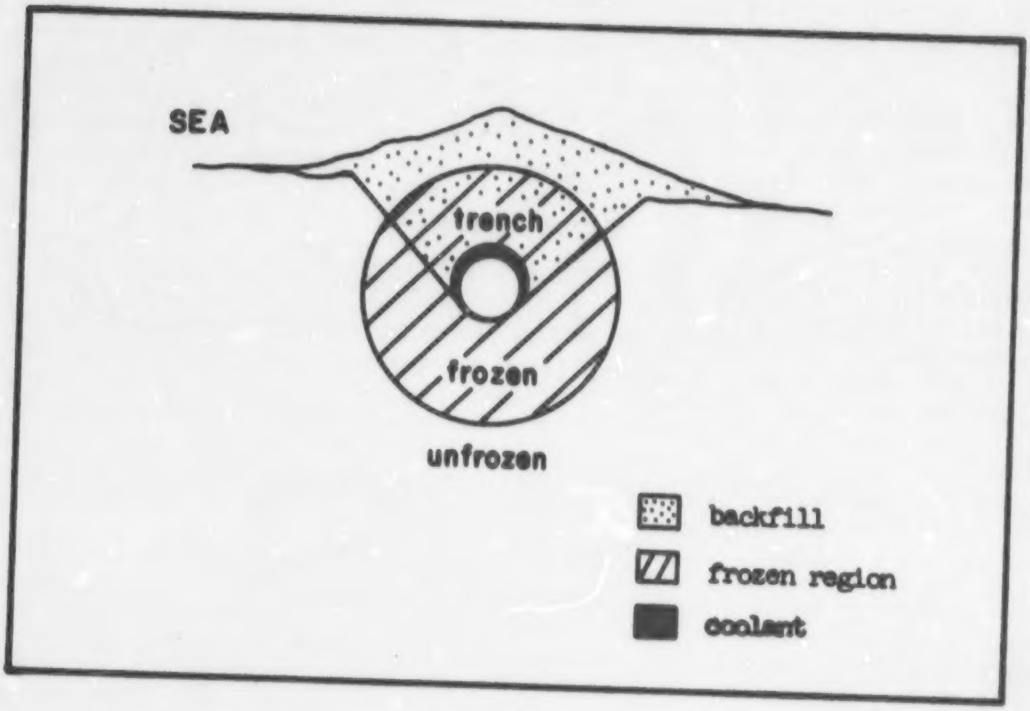


Figure 15. Cross-section of flowline bundle in trench in shallow water, with artificial permafrost protection against ice.
(Source: Palmer et al, 1979)

facilities at Rea Point include a sand-surfaced 1850 x 60 m airstrip suitable for both Hercules and Boeing 737 landings, a hangar for Panarctic's Twin Otter aircraft, a 1,675 m^2 warehouse, shop buildings, workers' quarters accommodating up to 140 persons, an oil-fired power plant, and steel fuel storage tanks with a combined capacity of 23 million litres (Davies, 1983/84).

Rea Point is resupplied by an annual sealift involving up to three dry cargo or fuel transport ships arriving within a four-week period beginning in the third week of August (B. Rhynold, pers. comm., 1984). One type of fuel carrier frequently chartered by Panarctic is the Finnish Lunni class icebreaking tanker (Figure 16), currently proposed as a future transport for Bent Horn oil (Panarctic, 1984). Since no docking facility is available for offloading dry goods at Rea Point, cargo carriers are positioned alongside the beach and an earthen ramp to the ship is constructed from beach material. Dry goods are then offloaded by means of forklifts and trucks. Offloading of fuel oil, on the other hand, is accomplished by means of two 152.4 mm by 180 m floating marine hoses connected to onshore flowlines leading to the storage tanks. Each sealift delivers 1,100 to 3,400 tonnes of dry goods and about 16 million litres of fuel oil. An additional 2 to 4 million litres of fuel oil is sometimes purchased from Esso in Resolute during the course of a season, while additional equipment or supplies are airlifted from Yellowknife or Edmonton.

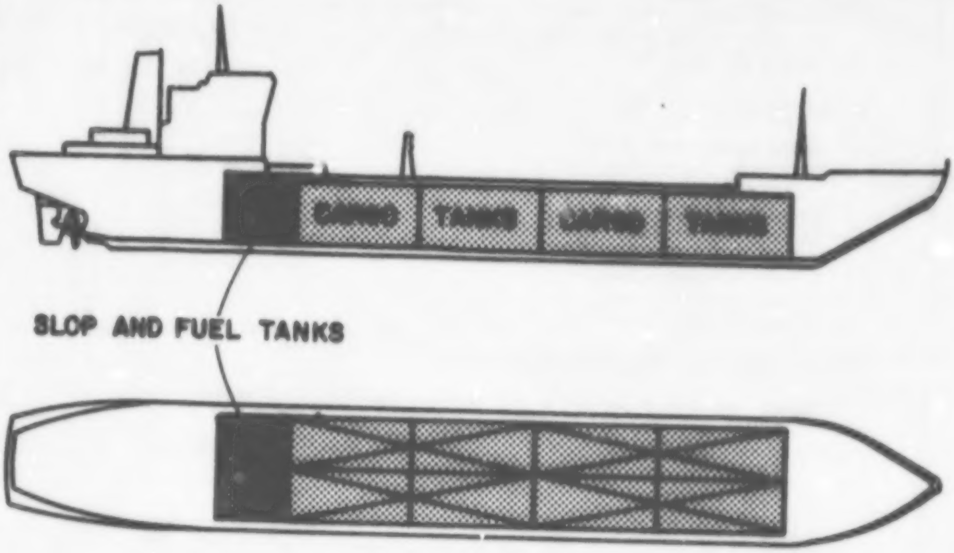
As the principal base of operations, Rea Point is involved in the staging and/or supply of all onshore or offshore drilling operations and many of the seismic programs in the region. Demobilized rigs are stored at Rea Point between drilling seasons and subsequently airlifted or moved by surface vehicle to new wellsites. Rig components are moved by surface transport if the new wellsite is within 250 km of Rea Point; beyond that distance, rig components and related equipment are airlifted by Hercules aircraft to the wellsite. Since the majority of new wells over the past five years have been located beyond a 250 km radius, most rigs were moved by airlift. Basic transport of rigs and camp components from Rea Point to the wellsite requires about 130 Hercules flights per rig, with an additional 40 to 50 flights required to transport fuels and drilling supplies during drilling operations. Hercules flights are made on an "as-need" basis to transport seismic vehicles from Rea Point or other staging areas to exploration locations. During the drilling season, up to four Boeing 737 flights leave Rea Point each week to exchange crews and supply fresh produce to outlying rigs. These flights are supplemented as needed by Twin Otter transporting light equipment and/or personnel.

Rea Point is also the main storage area for Panarctic's oil spill containment and cleanup equipment (Table 2), which are quickly airlifted to well locations when needed.

5.4.2 Drilling fluid disposal

5.4.2.1 Introduction

Exploration and delineation wells generate large quantities of waste drilling fluid during normal operations. For example, mud records, for 58 of 82 wells completed during the past decade, indicate that for each 100 m of well depth, each onshore and offshore well used an average of 10.2 and 12.2 tonnes of drilling mud respectively. Recorded totals indicate that over



Length,	164.45 m
Breadth moulded (main deck)	22.20 m
Draft, summer	9.50 m
Deadweight	15,955 tonnes
Speed	14.5 knots
Hull and Bulkheads	Doubled bottom and sides; 1.83 m between hull plates and cargo tanks
Cargo tanks	8
Cargo tank capacity	2,000 m^3

Figure 16. MT LUNNI cargo/fuel Transport.
(Source: Panarctic Oils Limited, 1984b)

Table 2. Oil Spill Containment and Cleanup Equipment Stored at Rea Point, Melville Island.
(Source: Panarctic Oils Limited, 1984)

Watercraft/Aircraft

2	Dehavilland DHC-6 Twin Otter Aircraft
1	Twin Otter Nose Ski

Skimmers/Pumps/Fittings

2	Roper Pumps, Gear Driven
1	Commercial Pump, Model PH15
1	Johnson Vertical Pump
1	Union Pump, Model TD25
1	Gardner-Denver Pump, Model PQ-2
6	3 Inch Yellowdog Pumps
2	4 Inch Yellowdog Pumps
2	2 Inch Skimmer Pumps
3	4 Inch Skimmer Pumps

Hoses/Connections/Portable Tanks

26	Tanks, Various sizes fromm 500 Gallons to 17,000 Gallons

Special Vehicles

14	Trailer Lo-Boys
5	Trailer Hi-Boys
12	Dolly Convertors
19	Kenworth Trucks
2	Hayes Trucks
19	Pick-up Trucks
6	Cranes
18	Forklifts
2	Skidoos
5	3-Wheeled Hondas
4	Foremost-Delta 3
2	Foremost-Commanders

Communications Equipment

5	CH25 SSB Transceivers, 100 Watt Pep, 115 VAC, 6 Channel, Canadian Marconi Co., Freq. on Request
2	CH 150 Transceivers, 150 Watt, 20 Channel for TTY operation as well
2	DT 56 VHF Mobile (FM) Units; Channels 165.52, 165.62, 165.72, 165.82, 165.92
2	TRITON 20 Motorola HF Transceiver, 20 Channel, 100 Watts, (may be operated 12 V DC) c/w antenna tuners
1	Non-Directional Beacon, Wilcox 785 D, 50 Watts, Identifier and Freq. on Request
1	Remote NDB Terminal c/w NDB Radar Transponder and helipad plating system (self-contained power source for up to 30 days duration without support)
1	Transportable VOR/DME Wilcox Electric model 485 B VOR model 596 B DME (self-contained power source)
2	Air to ground Edo-aire model 551 c/w dual altimeter (12 volt DC or 110 AC operation)
2	complete 6000' runway lights c/w markers

Sorbents/Chem. Treating Agents/Application Equip.

50	Conwed Utility Sorbent Pillows
1900	Sacks Sawdust (38000 kg)
1500	Bags Floor Dri

Table 2. Oil Spill Containment and Cleanup Equipment Stored at Rea Point, Melville Island.

continued

Generators/Lights

1	8 KW Generator
1	8.5 KW Generator
3	13 KW Generators
2	20 KW Generators
1	24 KW Generator
9	30 KW Generators
5	50 KW Generators
8	75 KW Generators
1	100 KW Generator
11	125 KW Generators
6	Maxi-lites

Earth Movers/Heavy Equipment

1	D4 Crawler Tractor
4	D3 Crawler Tractors
9	D6C Crawler Tractors
6	D7F Crawler Tractors
1	814 Wheeled Tractor
1	Scraper
8	Graders
7	Bombardier Skidozers
1	750 John Deere Caterpillar c/w Dozer and 12 ft. Ditcher
1	Rolligon
3	Nodwell Tracked Carriers

Other Equipment and Materials/Local Resources

50	Rolls Plastic Sheeting
2000	Empty Drums
36	Shovels
18	Power Saws
6	Thiokol Imps c/w Track Mounted Ice Augers

Disposal Facilities

4	Waste Oil Incinerator 450 Gallon
2	Cyclonator CY-100 Incinerators (Skid-Mounted)
4	Incinerator (Skid-Mounted)

Explosives

85,800 kg (total): Unigel, Vibrogel, Geogel, Forcite, Amex 2
(on November 31, 1983)

14,160 tonnes of drilling mud were used and discarded. In addition, unknown volumes of produced (formation) water and water used as the drilling mud medium were released.

The term "drilling fluid" in this section refers to a solution of solids and dissolved materials suspended in a water or oil medium. The term "drilling mud" represents the combination of solid materials carried by the liquid, while "drill cuttings" are formation cuttings circulated through the well to the platform surface.

Drilling fluid is a viscous slurry circulated through the well bore during drilling. The primary functions of drilling fluids include:

- transport of drill cuttings to the surface;
- cooling and lubrication of bit and drill string;
- maintenance of borehole stability;
- control of formation pressures;
- support for drill pipe and casing;
- transmission of hydraulic energy to the drill bit.

Components of fluid circulation systems may vary, but most rigs share the same overall scheme. Drilling fluid is pumped down the centre of the drill string to the drill bit, where fluid is mixed with cuttings and returned up the annulus to the surface. Mechanical devices such as shakers, desanders, and desilters remove cuttings from the fluid, thus allowing reuse of the drill mud components.

5.4.2.2 Classification of drilling fluids

Drilling fluids can be classified by either the liquid phase (water or oil) used to carry solid constituents, or the major constituents (polymer - gel, lignosulfonate or potassium chloride) added to control mud properties (Petrazzuolo, 1981). Water-base fluids are more commonly used, since oil-based fluids are restricted to applications where water-based fluids do not perform adequately or are likely to cause formation damage during completion (Northern Technical Services, 1981). Either fresh or saline water forms the continuous phase of water-based fluids, and diesel oil for oil-based fluids.

In water-based fluids, potassium chloride (KCl) muds are commonly used to prevent borehole sticking associated with excessive sloughing in soft formations. In Arctic operations, KCl muds are used to drill through permafrost to over 600 m in depths. KCl acts to depress the freezing point of the drilling mud, thus preventing borehole damage caused by the thawing of the surrounding permafrost. XC-polymer, prehydrated bentonite, guar gum, and hydroxyethyl cellulose are used as viscosifiers in KCl muds. Drispac or CMC may be used to reduce filtration, and caustic soda controls the pH of the fluid.

Polymer-gel muds are used in the intermediate stages of drilling at depths usually greater than 900 m. The primary advantage of these muds is more rapid penetration of the formation because of their low solids content. Other benefits include reducing the possibility of lost circulation, improved hydraulics, and reduced wear on the drill bit and pumping equipment (Northern Technical Services, 1981). Barite is commonly added to increase mud weight in order to prevent a "blowback" in formation pressure. X-C polymers, bentonite, and caustic soda are the other main constituents.

Lignosulfonate muds are primarily used when a formation pressure zone is encountered. Higher concentrations of lignosulfonate and lignite control fluid loss, induce temperature stability, and increase borehole stability. Barite, bentonite, and caustic soda are other major constituents.

Other less common water-based drilling fluids are described by McGlathlen (1980).

5.4.2.3 Drilling mud additives

Chemical additives are used to impart specific properties or enhance existing qualities of drilling muds. Some of the more common additives and the major functions of additive compounds are listed in Appendix B. Drilling conditions differ from well to well, and the composition of drilling muds is changed to suit borehole pressures and formation characteristics encountered while drilling. The rates of additive usage observed at Panarctic's operations illustrates the range and varying amounts which might be employed (Table 3). Barite, bentonite, caustic soda, and X-C polymers are the four drilling mud components used most often at all locations. Attapulgite clay is often used at offshore locations and contributes significantly to the total weight of solids used at offshore wellsites (Table 4).

Chemical composition of the drilling fluid changes with depth as bentonite and caustic soda used near the surface are replaced by barite, lignosulphonate, and lignin at greater depths. The major source of heavy metals in whole drilling muds are barite and lignosulphonate compounds. Table 5 outlines heavy metal concentrations in drilling muds used at the surface, intermediate, and bottom depths of one onshore and five offshore wells drilled between 1979 and 1981. Trace metal concentrations in various whole muds and specific components can be found in Neff (1982).

5.4.2.4 Oil contamination of drilling fluids

In the course of normal operations, drilling fluids are contaminated by oil in one of three ways:

1) penetration of oil-bearing formation;
2) use of a spotting fluid to free a stuck drill string;
3) use of an oil-based compound as a lubricant between the drill string and hole wall.

When an oil-bearing formation is penetrated, oil enters the drill fluid system through flushing of the drill cuttings. Oil also enters the drilling fluid systems if a diesel-spotting fluid is added to free drilling pipe that is sticking to the hole wall. Fluid is spotted around the point at which the drill string is stuck and the pipe is allowed to soak until free of the hole wall. In most cases, the pipe must soak for several hours during which time the diesel fluid percolates through the drilling fluid. As it percolates, the oil becomes emulsified and cannot be separated from the drilling fluid. Oil is also added to drilling fluid to act as a lubricant between the drill string and hole wall while drilling or tripping.

Table 3. Common Drill Fluid Components and Rates of Use at Panarctic's Sverdrup Basin Wells. (Source: Panarctic Oils Limited correspondence ARR-356-422.911.10, 15 Dec. 1981)

PRODUCT	DESCRIPTION	RATE OF USE	LC-50	PURPOSE
Barite	Barite	0-1140 Kg/m^3	50,000ppm 1981 [1] ** 1982	for increasing mud weight
Salt gel	Attapulgite	0-70 Kg/m^3	23,500ppm [3]	Viscosifier in salt water muds
Gel Bentonite	Bentonite	0-70 Kg/m^3	750,000ppm [3]	Viscosity and filtration control in water base muds
Kelzan Duovis	XC Polymer	1-10 Kg/m^3	1900ppm [3] **	Viscosifier and fluid loss control additive
Caustic Soda	Caustic Soda	0-10 Kg/m^3	105ppm [2]	to maintain PH at 9.5
Bicarbonate of Soda	Sodium Bicarbonate	0-1.5 Kg/m^3	7500ppm [2]	to control PH value
KCL. Potassium Cloride	Potassium Cloride	0-35 Kg/m^3	10,000ppm [2]	shale control inhibitor
Tannathin	Lignite	0-10 Kg/m^3	6500ppm [3]	dispursant
Spersene	Chrome Lignosulphonate	0-10 Kg/m^3	3750ppm [3]	dispursant and fluid loss control for water base muds
C.M.C.	Sodium Carboxymethyl Cellulose	0-1 Kg/m^3	3000ppm [2]	filtrate reducer
Kwik Seal	Kwik Seal	0-2 Kg/m^3	Random	to prevent lost circulation
Inco Plug, Walnut Hulls, Nut Plug	Walnut Hulls	0-2 Kg/m^3	2800ppm stirred [2] 5500ppm settled	to prevent lost circulation
Salt	Salt	0-30 Kg/m^3	10,000ppm [3]	For saturated salt muds and resistivity control.
Chrome Alum	Chrome Alum	0-.1 Kg/m^3	730ppm [3]	For use in cross linking XC. systems.
B-Free	Spotting Fluid for stuck pipe	not normally used	7.5 microlitres/litre [1]	diesel fuel mix to be used only to free a drill string due to differential sticking.
Skot-Free	Surfacant mixed with diesel	not normally used	14.5mg/l [1]	
Pipe Lax	Surfacant Mixed with diesel	not normally used	1700ppm [3]	
Aluminum Stearate	Aluminum Stearate Powder	up to 50 kg/well	1100ppm [2]	Defoamer
SAPP	Sodium Acid Pyrophosphate	up to 25 kg/well	1700ppm [2]	for treating cement contamination
Mica	Mica	0-2 Kg/m^3	random [2]	to prevent lost circulation
Sawdust	Sawdust	0-2 Kg/m^3	random [2]	to prevent lost circulation
Poltex Q Broxin	Ferrochrome Lignosulphonate	0-10 Kg/m^3	3000ppm [3] 1700ppm [3]	dispursant and fluid loss control additive for water base muds

Table 3. Common Drill Fluid Components and Rates of Use at Panarctic's Sverdrup Basin Wells.
continued

PRODUCT	DESCRIPTION	RATE OF USE	LC-50	PURPOSE
Lime	Lime	0-10 Kg/m^3	50ppm [3]	source of calcium for formulating lime muds
Sureflo W-300	Propriatory surface active agent	.001-.002 Kg/m^3	90 mg/l [1]	reduce or eliminate foaming in drilling mud
LD-8	Propriatory surfactant	.001-.002 Kg/m^3	.67 g/l [1]	nonhydrocarbon defoamer
Staflo	Poylanionic Cellulose Powder	0-4 Kg/m^3	4.2 g/l [1]	fluid loss reducer
Coat 888	Sodium Sulphide	.3-.5 Kg/m^3	7 g/l [1]	oxygen scavenger
Soda Ash	Sodium Carbonate	.75-1.5 Kg/m^3	75 mg/l [1]	treat out calcium from mud system
Coat 129	**	.2-.4 Kg/m^3	**	Oxygen scavenger and scale inhibitor
Nickel Sulfate	Nickel Sulfate	.04-.08 Kg/m^3	**	Catalyst for use with Coat 888
Torque-less	specific size glass beads	0-12 Kg/m^3	**	lubricant to decrease torque load on drill string
Value 100	Detergent	variable	**	rig wash
Alchem Chem	**	up to 12 balls/24 hrs.	**	boiler additive
Arctic Blend	**	up kto 3.1 oz./24 hrs.	**	boiler additive
Alchem Liquid High PH	**	variable	**	boiler additive
Ultraglide 100		variable	800ppm [1]	Premixed B.O.P. hydraulic fluid
L.O.C.	Detergent	variable	45ppm [1]	rig wash
Industrial Clean	Detergent	variable	240ppm [1]	rig wash
Diesel	Diesel	not normally used	1ppm [3]	mixed with D-Free, Shot-Free or Pipe-lax to free a drill string stuck due to differential sticking

** - Information to be forthcoming.

1 - Panarctic Files

2 - Industry/Government Working Group "A" under the auspices of the Arctic Petroleum Operators Assoc. and Environment Canada, Volume #1 - Summary report of Industry/Government Research on Pollution From Drilling Wastes, January, 1976.

3 - Other Sources.

Table 4. Range and Mean Use of Common Drilling Mud Components for each 100 m Well Depth.
(Source: Ladouceur, E., Environmental Review of Panarctic Oils Limited Offshore Drilling Operations in the High Arctic, 1979 and 1980 Seasons.)

	ONSHORE WELLS (n=36)			OFFSHORE WELLS (n=22)		
	RANGE (kg/100 m)	MEAN (kg/100 m)	n OF WELLS USING COMPONENT	RANGE (kg/100 m)	MEAN (kg/100 m)	n OF WELLS USING COMPONENT
Attapulgite Clay	0-981	475	6	0-2,225	668	19
Barite	166-37,274	4,289	36	3,426-19,609	9,151	22
Bentonite Clay	15-6,135	1,257	36	0-3,191	1,199	20
Caustic Soda	0-370	163	34	16-390	148	22
Chrome Alum	0-99	48	29	0-50	16	4
Chrome Lignosulphonate	0-369	69	13	0-77	38	5
Lignite	0-95	31	7	0-111	31	11
Potassium Chloride	0-1,201	644	4	0-3,592	2,595	3
X-C Polymer	60-545	272	36	66-567	220	22

Table 5. Analysis of Dissolved Metals in Drilling Fluids Used at Three Drilling Depth Ranges. (Source: COGLA Well History Microfiche Drilling Authorities. See Appendix C.)

WELL DEPTH	METALS	WHITEFISH H-63	HAZEN ST. F-54	HOODOO N-52	WHITEFISH 2H-63	CHAR G-07	BALAENA D-58
		CONCENTRATION			CONCENTRATION		
		(mg/l)	(mg/l)	(mg/l)	(mg/kg)	(mg/kg)	(mg/kg)
0-800m	Cu	0.02	not available	[illegible]	3.1	28.8	1.9
	Pb	0.15	0.59	[illegible]	4.4	81.1	6.0
	Cr	<0.05	not available	0.08	8.8	25.4	2.0
	Cd	0.04	0.15	<0.01	2.2	7.6	0.61
	Ni	0.15	0.39	0.08	4.2	23.9	1.3
	Zn	<0.02	0.04	0.12	14.8	423.0	65.0
	Hg	0.25*	<0.02*	0.82*	0.20**	0.36**	4.9**
800-1,600m	Cu	0.03	0.04	0.04	12.2	5.2	6.1
	Pb	0.19	0.24	0.22	26.0	13.0	29.3
	Cr	1.16	<0.05	0.03	11.0	6.2	12.6
	Cd	0.05	0.10	<0.01	5.6	1.5	0.30
	Ni	0.23	0.70	0.08	7.8	3.6	5.8
	Zn	0.06	0.10	0.16	188.0	81.0	83.5
	Hg	<0.02*	0.57*	0.10*	1.3**	1.7**	3.2**
1,600m +	Cu	0.02	0.03	0.08	10.9	16.1	8.3
	Pb	0.22	0.19	<0.02	81.0	37.0	86.1
	Cr	0.20	0.52	<0.01	16.3	7.6	27.6
	Cd	0.07	0.05	<0.01	3.8	0.50	4.2
	Ni	0.28	0.26	0.08	6.2	10.8	9.9
	Zn	0.02	0.03	0.78	229.0	437.0	137.0
	Hg	<0.02*	0.08*	1.20*	8.2**	4.2**	2.6**

* Hg concentration measured in µg/l.

** Hg concentration measured in mg/l.

5.4.2.5 Onshore disposal practices

At onshore drilling locations, waste drill fluid and cuttings are discharged into a sump adjacent to the drill rig. The sump is generally blasted out with explosives and the loosened material removed and heaped to one side with bulldozers. The dimensions of these sumps vary according to the anticipated volume of drill fluids and cuttings which, in turn, is dependent on the composition of the drilled strata. To accommodate the average of 10.2 tonnes of drilling fluids used for every 100 m of drilling depths, the sump typically has dimensions of about 50 by 30 by 4 m or a volume of about 6,000 m^3. Just over two-thirds of this volume is available for disposal however, since DIAND operating conditions for onshore wells require a minimum of 1.2 m of freeboard to be left upon completion of the well. Drill fluids which have impinged or may potentially encroach upon this freeboard are required to be discharged into an additional sump.

Backfilling of the sump is usually not carried out until mid or late winter when frozen ground reduces surficial terrain disturbances by heavy vehicles and sump fluids are sufficiently frozen to support the weight of overburden. Excavated sump material is mounded over the frozen fluids (Figure 17) partly to insulate and prevent thawing of disposed fluids and partly to compensate for subsidence.

The costs of sump construction and backfilling and the relatively low levels of biological activity at some wellsites has prompted industry to assess the feasibility of discharging drilling fluids directly to the ground surface. A study of one surface disposal method was undertaken at the Panarctic Dome et al. Hoodoo N-52 wellsite between 29 September and 10 November 1981. A total of 950 m^3 of drilling fluid was spread to an average thickness of 1.5 to 2.0 m over a 150 m^2 area enclosed by snow berms (French Arctic Consultants, 1982a). Experimental study of vegetation and water quality parameters indicate short-term effects of surface disposal to be relatively localized, although these results are viewed as inconclusive by Environmental Protection Service personnel (W. Fenton, pers. comm., 1984).

5.4.2.6 Offshore disposal practices

Drill fluids and cuttings from each well are normally discharged into Arctic waters in accordance with sections of the Canada Oil and Gas Drilling Regulations administered by the Canada Oil and Gas Lands Administration (COGLA) and Environmental Operating Conditions administered by the Arctic Waters Advisory Committee (AWAC). No treatment is required for conductor hole cuttings and seawater used as a drilling fluid, which are discharged directly onto the sea floor. Drilling fluids (including muds) and cuttings generated by drilling below conductor hole depth are returned to the surface where separate treatments are given to oil-contaminated and oil-free material. The Environmental Operating Conditions contain a general requirement for oil-free drilling fluids to be diluted prior to discharge. In practice, drilling fluids are diluted to achieve a 25 to 1 ratio of water to fluid, after which the diluted mixture is discharged to ocean waters from a point 10 m below the sea ice bottom. Oil-contaminated drilling fluids are treated and disposed of according to practices outlined in Panarctic's "Oil-Contaminated Drilling Waste Contingency Plan" (Panarctic, 1981). Drilled cuttings containing free oil are collected at the rig surface and placed in containers for disposal at

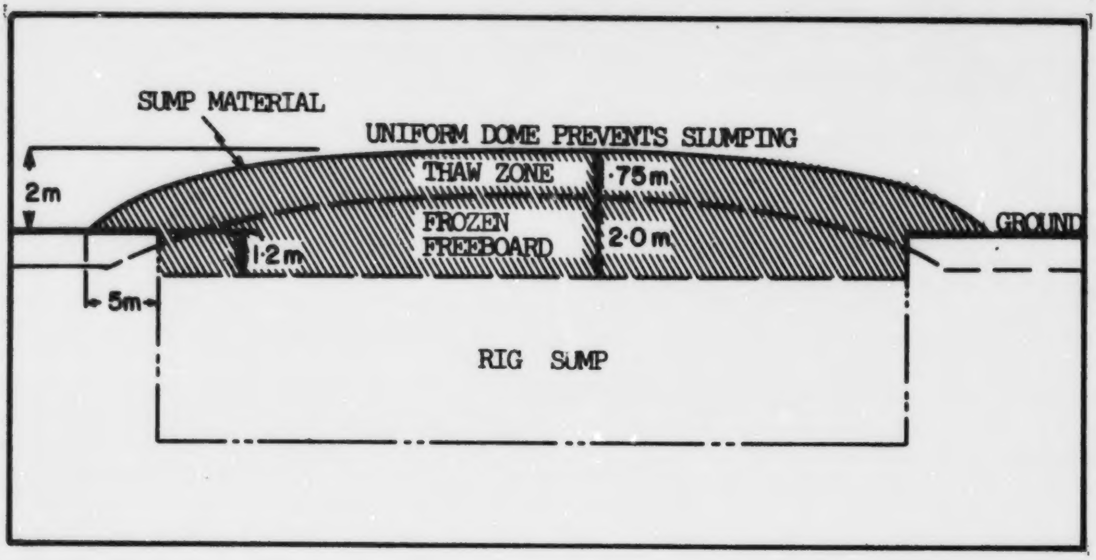


Figure 17. Schematic of Disposal Sump After Backfilling.
(Adapted from French, 1978)

an onshore disposal site. Drilling fluids containing emulsified oil are diluted to the extent that the oil constitutes less than 0.5 percent of the diluted volume. Like uncontaminated drill fluids, the diluted mixture is discharged into ocean waters at a point 10 m below the ice bottom.

To date, the only recorded use of oil-based drilling fluids has been at the Panarctic *et al*. Cisco M-22 well completed in April 1984. Contaminated drilling fluids were segregated at the well surface and transported to Lougheed Island for incineration and burial.

Combustible garbage and debris are incinerated daily in a oil-fired incincerator. The residue and non-combustible debris are transported to an onshore garbage pit and buried or is packed in containers for transport to Rea Point and subsequent burial.

5.5 Hydrocarbon drilling activities, 1974 to 1984

5.5.1 Operator involvement in drilling

Since 1974, the majority of exploration and delineation drilling in the Sverdrup Basin has been carried out under the auspices of Panarctic Oils Limited. To illustrate, 68 of the 80 wells drilled in the Region between January 1974 and June 1984 were sponsored by Panarctic with the remaining 12 wells divided among eight other oil companies (Figure 18). Panarctic's drilling activities were most intense from 1974 to 1978, when 44 of its 68 wells were drilled at an average of about nine wells per year. Between January 1979 and June 1984, Panarctic's efforts were nearly halved as 24 wells were drilled for an average of less than five wells per year. Panarctic's drilling activities in both of these periods far outpaced those of the other companies active in the Region. In terms of wells drilled, Dome Petroleum Limited was a distant second to Panarctic with just four wells to its credit, while Elf Oil Exploration Limited was third with two wells. Only Panarctic and Dome completed more than a single well in one year. All wells drilled by companies other than Panarctic were completed prior to 1981. Panarctic has continued as the lead operator in the Region since 1981.

Despite the overall intensity of its drilling activities, Panarctic has tended to confine exploratory and delineation drilling to the central portion of the Sverdrup Basin, roughly bounded by Ellef Ringnes and Cameron islands and Sabine Peninsula on Melville Island. Drilling has focused on six areas: Sabine Peninsula and the offshore regions east and west of the Peninsula, Cameron Island, Danish Strait, the southern half of Ellef Ringnes Island, Maclean Strait, and offshore areas west of Lougheed Island. Isolated Panarctic wells can be found near Hecla and Griper Bay on Melville Island, the northwest tip of Melville Island, Eglinton Island, northern Ellef Ringnes Island, and Bathurst Island. Panarctic's recent (1982 to present) drilling activities have primarily focused on offshore locations in Maclean Strait, Danish Strait, west of Lougheed Island and Hazen Strait, east of Mackenzie King Island, and onshore locations on Sabine Peninsula.

In contrast, wells drilled by the remaining eight companies were more isolated or widely located throughout the Sverdrup Basin Region. Dome Petroleum's wells, for example, were located on Meighen Island, King Christian Island, Sabine Peninsula, and southern Ellef Ringnes Island. Elf Oil Exploration Limited (Elfex) confined its activities to Prince Patrick Island, drilling two wells on the southern and western portions of the Island. Single

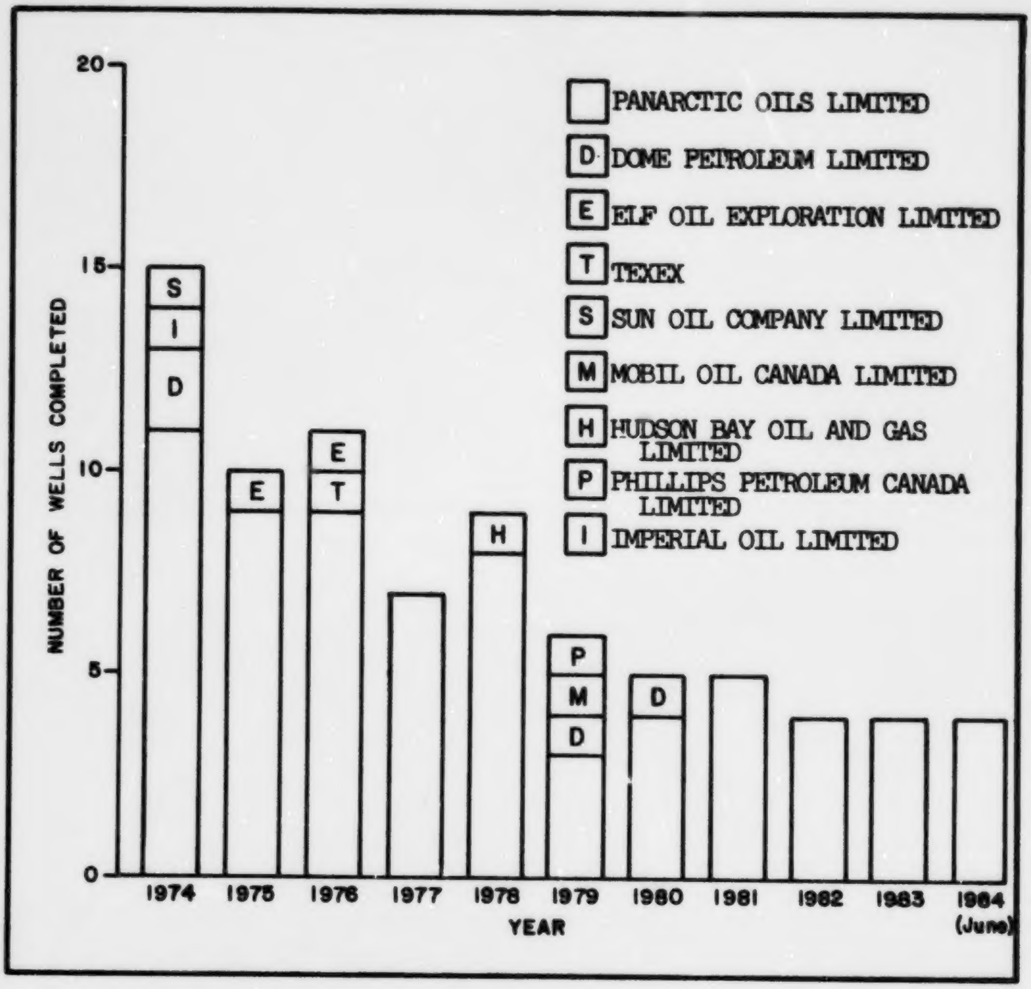
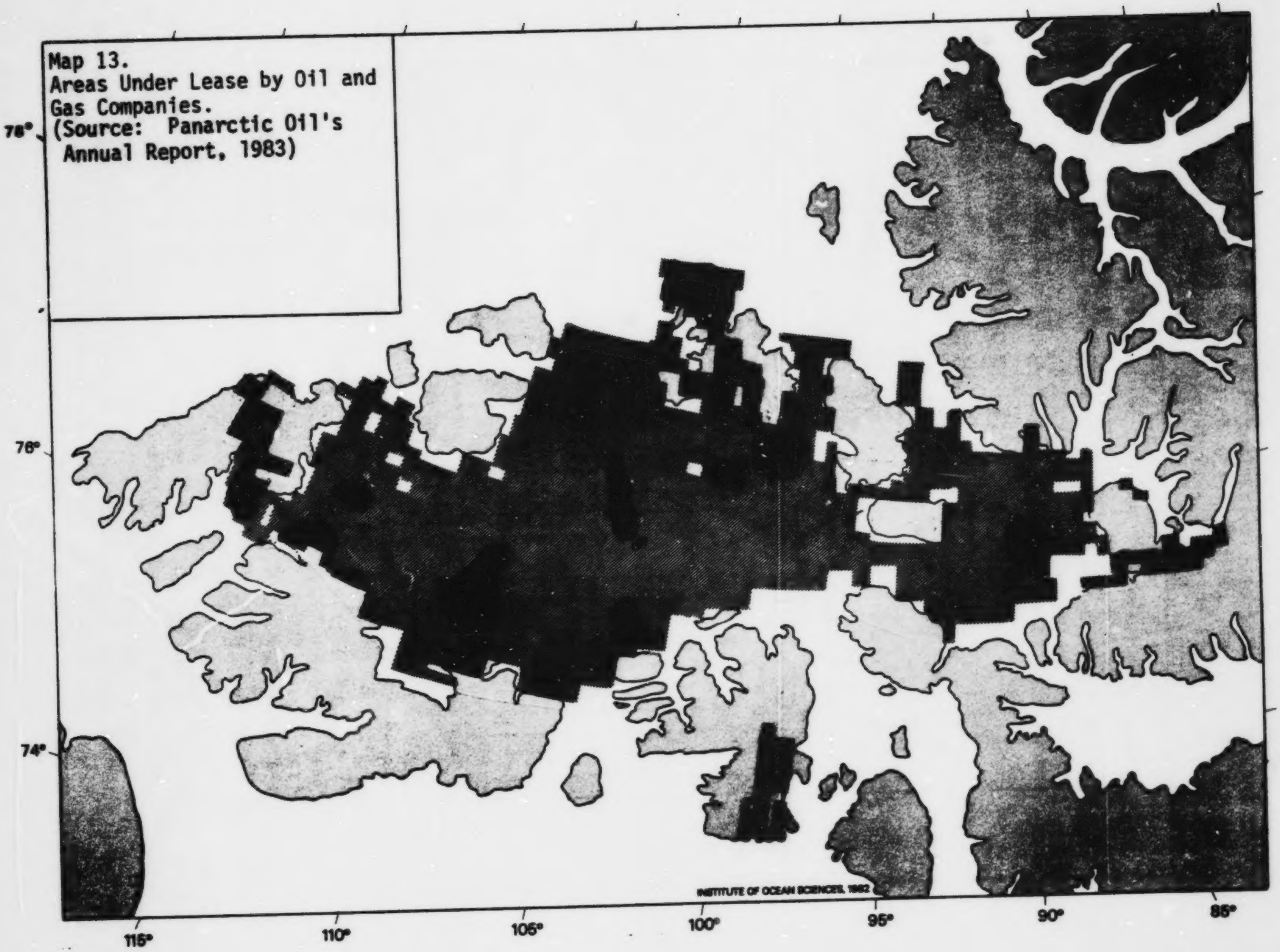


Figure 18. Sverdrup Basin Wells Completed by Company, 1974 to 1984.



Map 13.
Areas Under Lease by Oil and Gas Companies.
(Source: Panarctic Oil's Annual Report, 1983)

NO.	WELL NAME
03	Panarctic et al Drake Point D-68
06	Panarctic Tenn et al W. Hecla N-52
08	Panarctic Tenn et al Homestead Drake E-78
09	Panarctic Gulf Eglinton P-24
10	Panarctic Homestead POR N. Sabine H-49
12	Panarctic Dome et al Sherard Bay F-14
13	Panarctic et al Pedder Point D-49
16	Panarctic Collingwood K-33
18	Panarctic Gulf et al East Drake I-55
19	Panarctic et al Pat Bay A-72
20	Panarctic Tenn et al Drake D-73
22	Panarctic et al Chads Creek B-64
25	Panarctic et al E. Hecla C-32
28	Panarctic et al Sabine Bay A-07
29	Panarctic W. Hecla P-62
31	Panarctic Tenn CS N.W. Hecla M-25
34	Panarctic Tenn et al W. Hecla C-05
38	Panarctic N.E. Drake P-40
39	Panarctic S.W. Hecla C-58
42	Panarctic AIEG et al Depot Island C-44
44	Panarctic et al Richardson Point G-12
46	Panarctic et al AIEG Roche Point J-43
47	Panarctic Norcen AIEG et al Grassy 1-34
48	Panarctic Drake F-76
49	Panarctic et al Beverly Inlet G-13
50	Panarctic et al Drake Point K-79
55	Panarctic AIEG et al Desbarats B-73
57	Panarctic AIEG Whitefish H-63
61	Panarctic AIEG Whitefish 2H-63
69	Panarctic et al Cisco C-42
70	Panarctic et al Cape Mamen F-24
71	Panarctic et al Whitefish A-26
73	Panarctic et al Cisco K-58
76	Panarctic et al Maryatt Point K-71
77	Panarctic et al Cisco M-22
79	Panarctic et al Sherard Bay F-34

Map 14a.
Drilling Activities by
Panarctic Oils,
1974 to 1984.

200 METRE DEPTH CONTOUR

100 km

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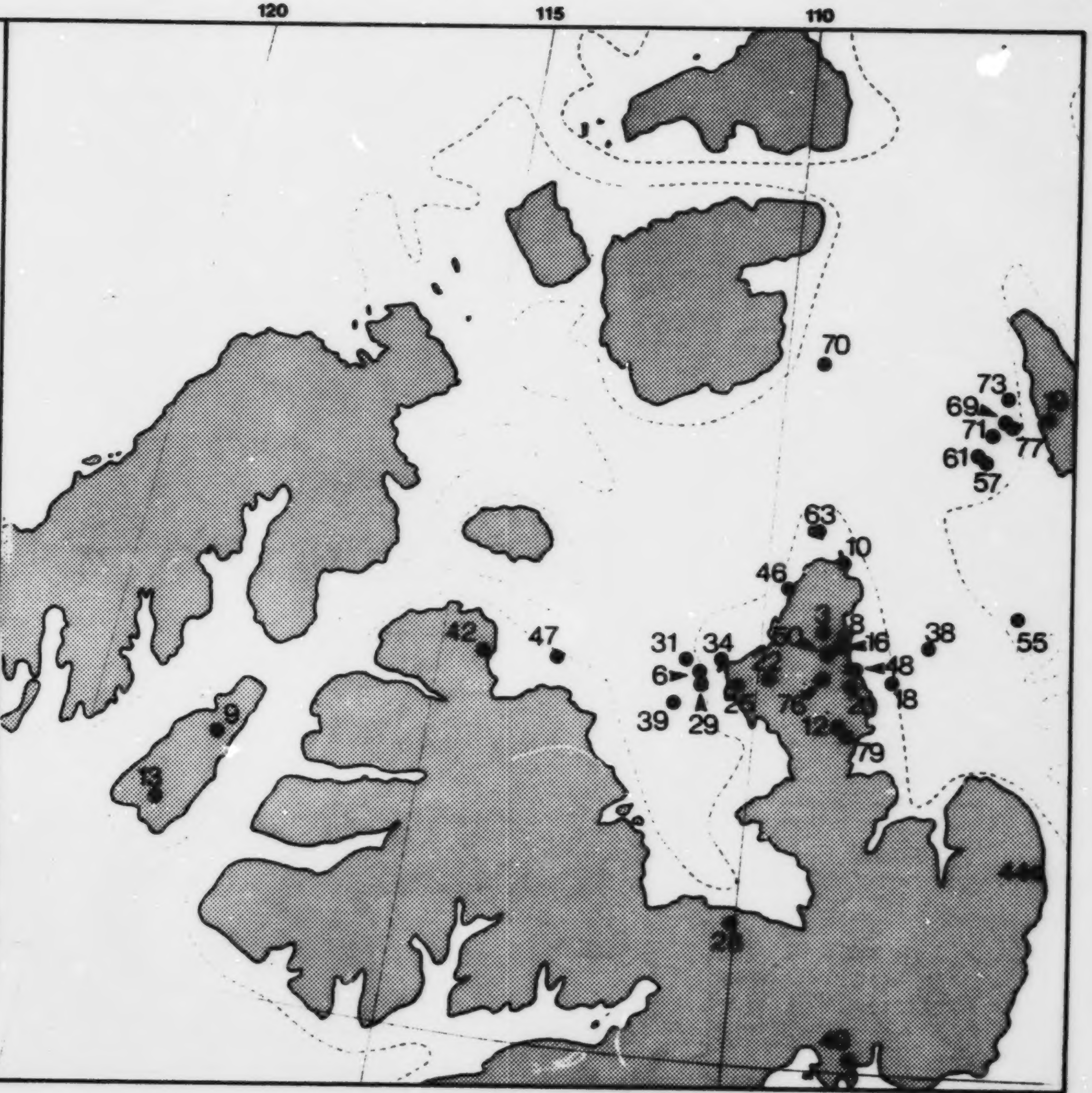

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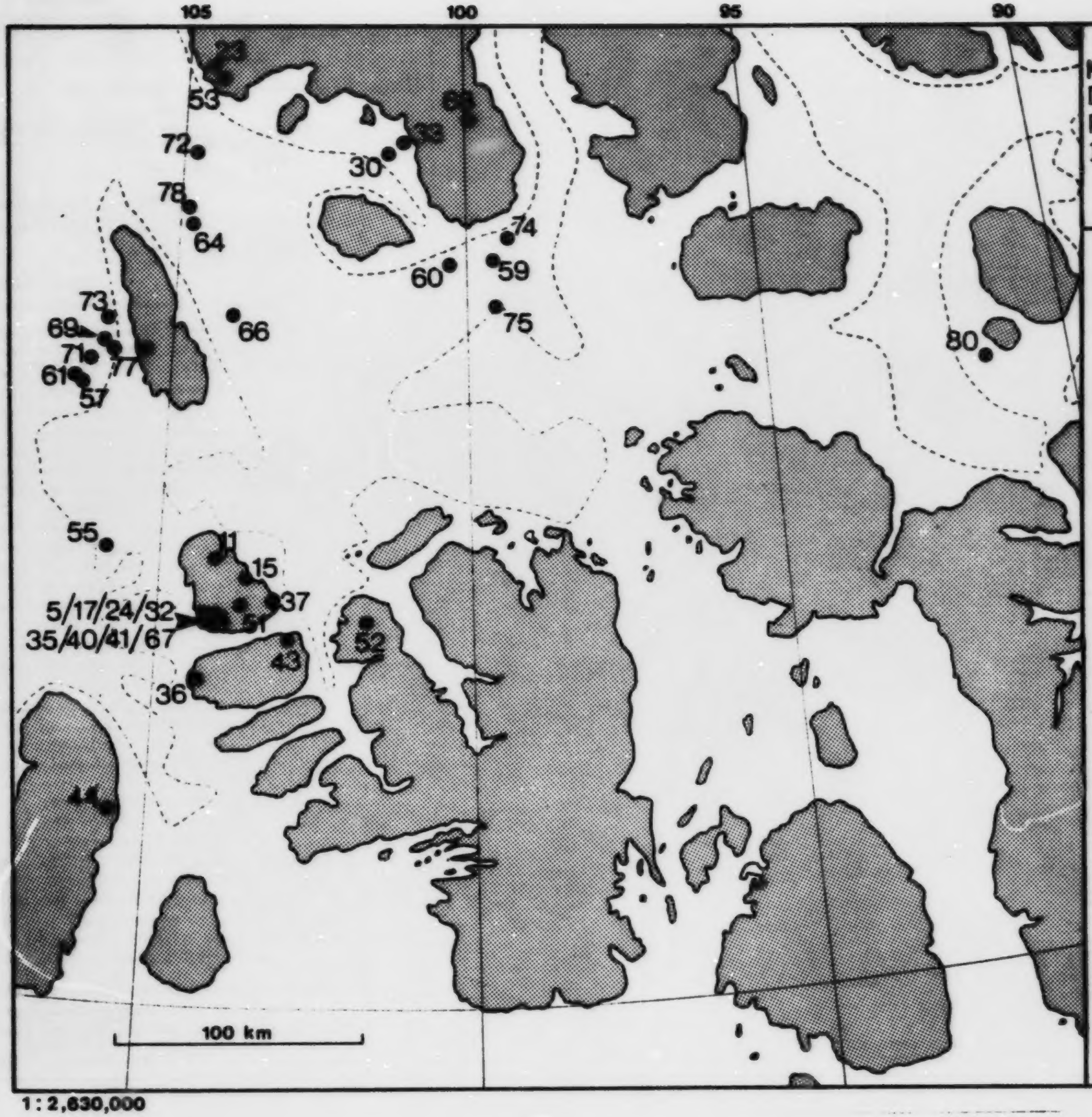
Map 14b.
Drilling Activities by
Panarctic Oils,
1974 to 1984.



NO.	WELL NAME
05	Panarctic Tenn et al Bent Horn N-72
11	Panarctic Tenn Robert Harbour K-07
15	Panarctic Cape Fleetwood M-21
17	Panarctic et al W. Bent Horn C-44
23	Panarctic Hocklin Point D-23
24	Panarctic Bent Horn F-72
30	Panarctic et al Jackson Bay G-16
32	Panarctic W. Bent Horn E-43
33	Panarctic et al Jackson Bay G-16A
35	Panarctic et al West Bent Horn A-02
36	Panarctic et al Key Point O-51
37	Panarctic Charles Point G-07
40	Panarctic et al West Bent Horn I-01A
41	Panarctic West Bent Horn N-12
43	Panarctic Sophie Point G-19
44	Panarctic et al Richardson Point G-12
51	Panarctic et al Bent Horn A-57
52	Panarctic et al Stokes Range J-11
53	Panarctic et al Noice D-41
55	Panarctic AIEG et al Desbarats B-73
57	Panarctic AIEG Whitefish H-63
59	Panarctic AIEG Dome PPC Char G-07
60	Panarctic AIEG PPC Balaena D-58
61	Panarctic AIEG Whitefish 2H-63
64	Panarctic AIEG PPC Dome Skate B-80
66	Panarctic AIEG PPC Dome Maclean I-72
67	Panarctic W. Bent Horn O-02
68	Panarctic Dome et al Hoodoo H-52
69	Panarctic et al Cisco C-42
71	Panarctic et al Whitefish A-26
72	Panarctic et al Sculpin K-08
73	Panarctic et al Cisco K-58
74	Panarctic et al Cape Macmillan 2K-15
75	Panarctic et al Grenadier A-26
77	Panarctic et al Cisco M-22
78	Panarctic et al Skate C-59
80	Panarctic et al Buckingham O-68

------200 METRE DEPTH CONTOUR

1:2,630,000

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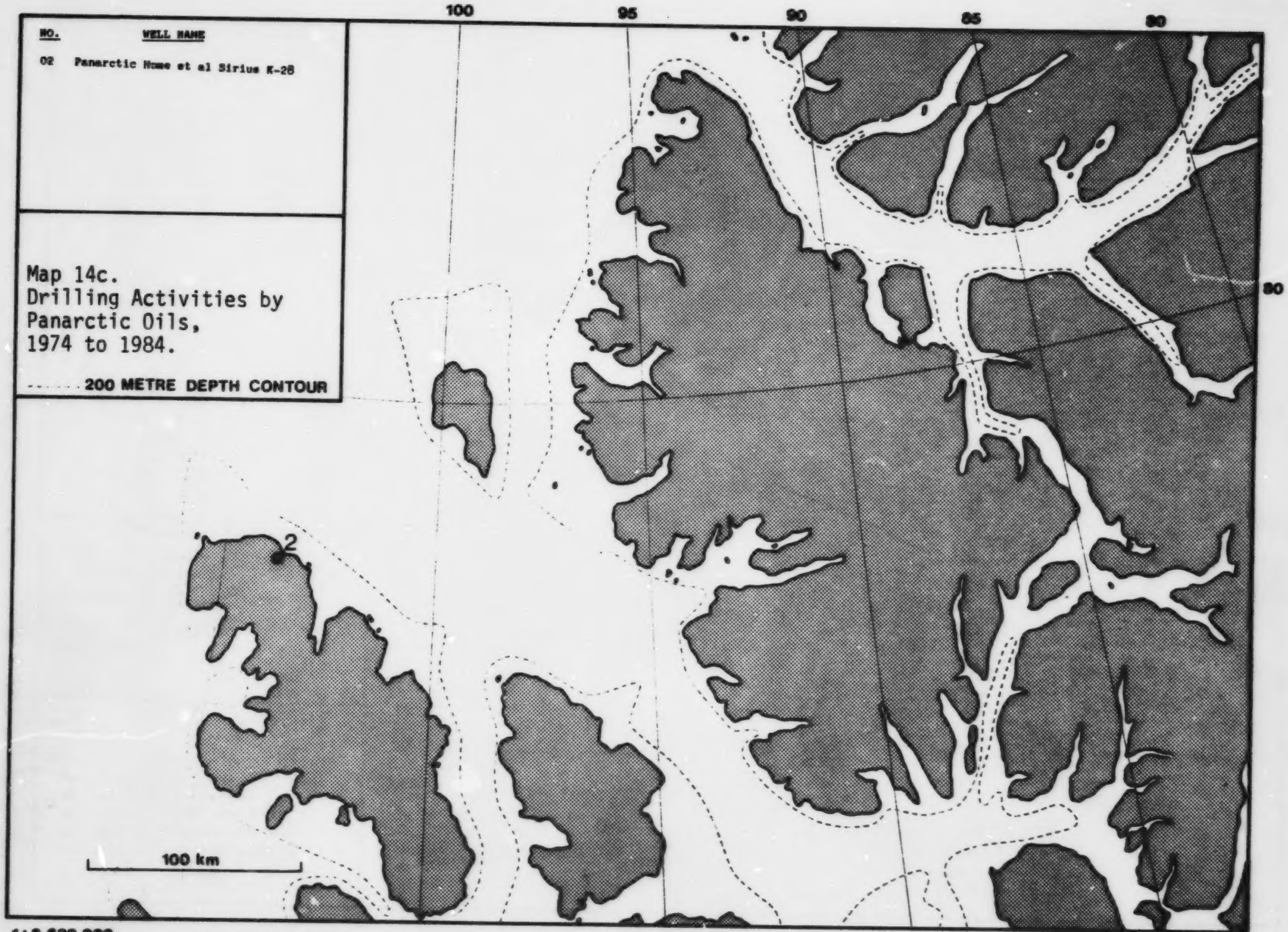

NO.	WELL NAME
02	Panarctic Hume et al Sirius K-28

Map 14c.
Drilling Activities by
Panarctic Oils,
1974 to 1984.

...... 200 METRE DEPTH CONTOUR

1:2,630,000

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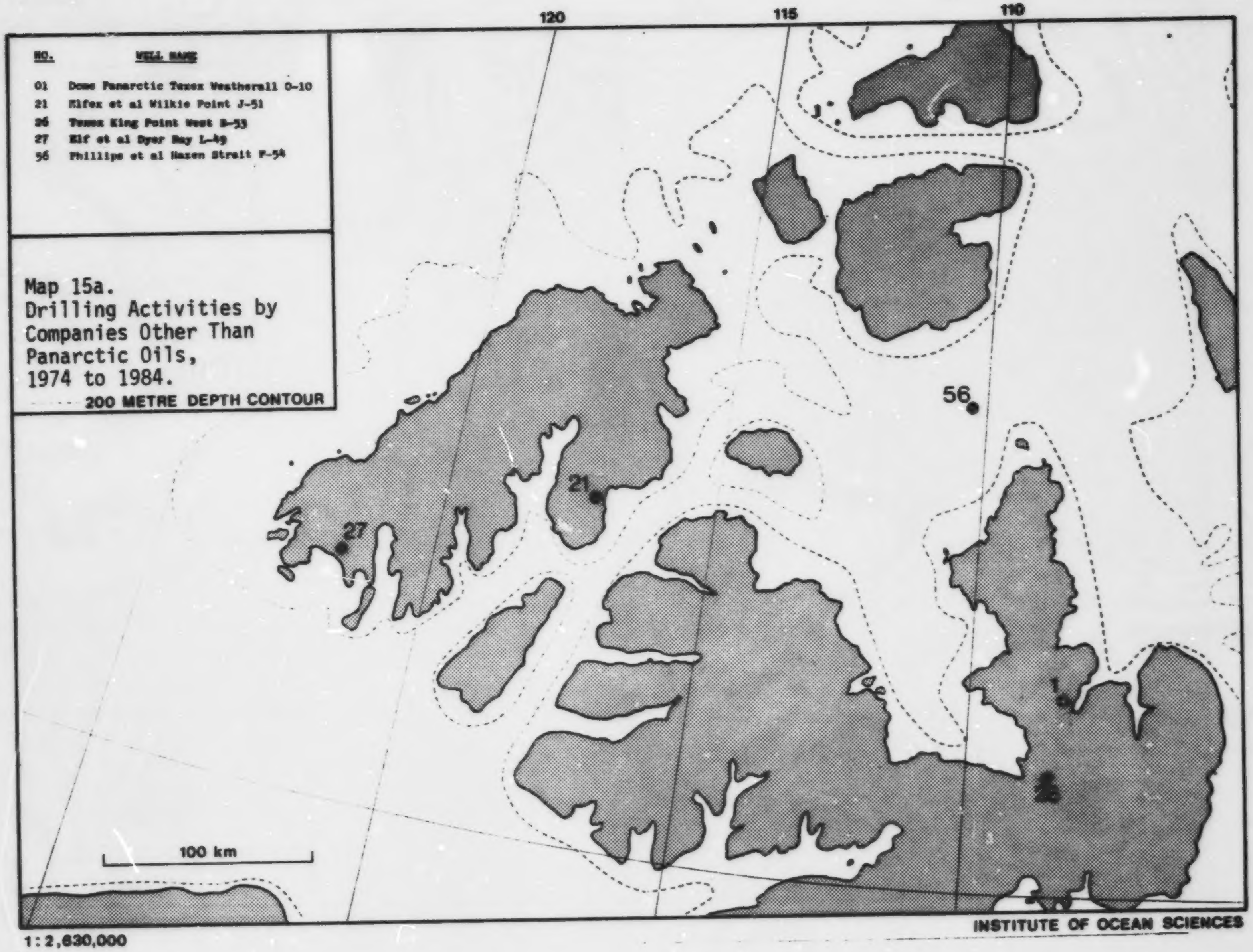
120
115
110
NO.
WELL NAME
01 Dome Panarctic Texex Weatherall O-10
21 Elfex et al Wilkie Point J-51
26 Texex King Point West B-53
27 Elf et al Dyer Bay L-49
56 Phillips et al Hazen Strait F-54
200 METRE DEPTH CONTOUR
56
21
27
1
26
100 km
1: 2,630,000
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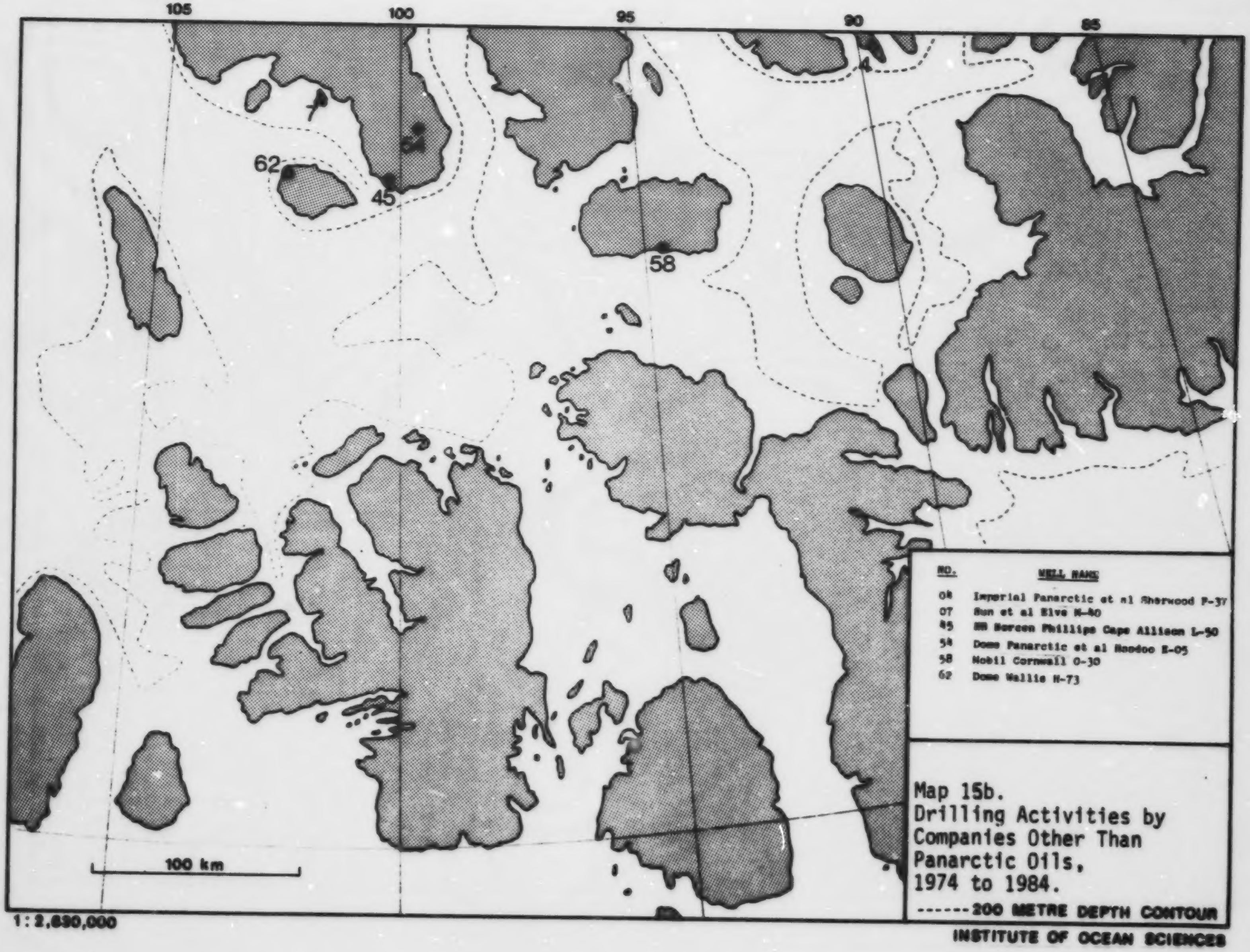
Map 15a.
Drilling Activities by
Companies Other Than
Panarctic Oils,
1974 to 1984.



NO.	WELL NAME
04	Imperial Panarctic et al Sherwood F-37
07	Sun et al Elve M-80
45	BP Boreas Phillips Cape Allison L-50
54	Dome Panarctic et al Hoodoo E-05
58	Mobil Cornwall O-30
62	Dome Wallis H-73

Map 15b.
Drilling Activities by
Companies Other Than
Panarctic Oils,
1974 to 1984.

------200 METRE DEPTH CONTOUR

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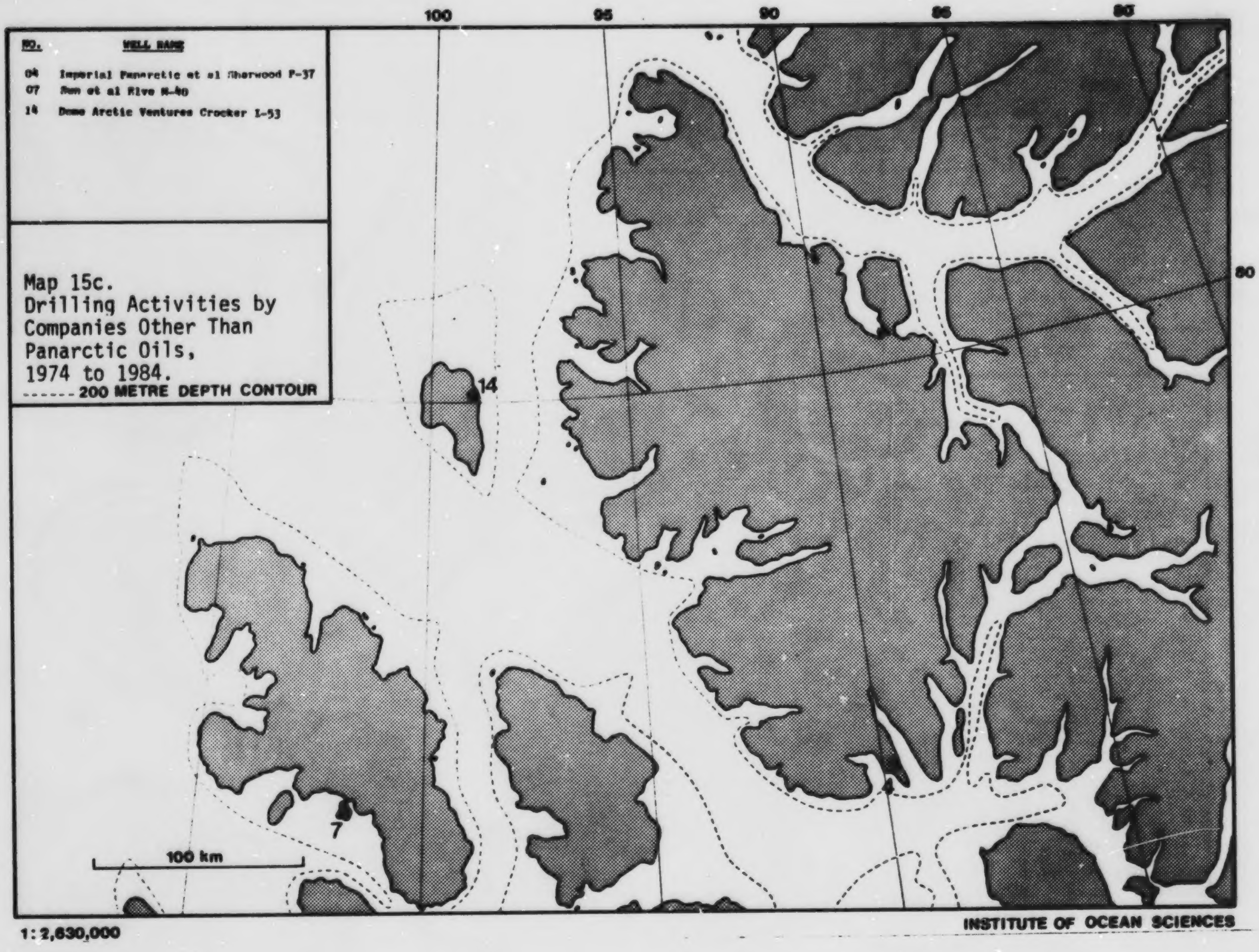


NO.	WELL NAME
04	Imperial Panarctic et al Sherwood F-37
07	Sun et al Rive N-40
14	Dome Arctic Ventures Crocker I-53

Map 15c.
Drilling Activities by Companies Other Than Panarctic Oils, 1974 to 1984.

wells by Mobil Oil Canada Limited, Hudson Bay Oil and Gas Limited, Phillips Petroleum Canada Limited, Sun Oil Company Limited (Sunoco), Imperial Oil Limited, and Texaco Canada Limited were drilled on Cornwall Island, southern Ellef Ringnes Island, Hazen Strait, Ellef Ringnes Island, southern Axel Heiberg Island, and Hecla and Griper Bay respectively.

5.5.2 Onshore and offshore drilling comparison

Exploration and delineation drilling in the Sverdrup Basin showed a marked shift in emphasis from onshore to offshore locations between 1974 and 1984 (Figure 19). Initially, from 1974 to 1978, the majority of wells (approximately 80%) were drilled at onshore locations. However, by 1979, drilling was evenly divided between onshore and offshore locations. More recently (1980 to June, 1984), onshore wells comprised less than 25% of drilling locations. This decline was not due to a corresponding increase in the annual number of offshore wells drilled during this period. As Figure 19 indicates, the number of offshore wells drilled from 1976 to 1984 ranged from two and four wells per year with a mean of just over three offshore wells per year. Since 1976 (the first year of extensive use of artificially-strengthened ice platforms), the relative number of offshore wells drilled each year has remained somewhat constant, while the relative numbers of onshore wells declined dramatically. Thus, the increasing share of drilling activities contributed by offshore wells reflects a declining interest in onshore drilling as opposed to increased interest in offshore locations.

5.5.3 Areal and chronological distribution of exploration drilling

5.5.3.1 Drilling activities, 1974 to 1978

Exploratory wells completed between 1974 and 1978 were concentrated to Melville, Cameron and Ellef Ringnes islands and in offshore areas adjacent to Sabine Peninsula. Of 53 wells, 42 were drilled on land masses and 11 were completed offshore. Melville Island served as the focus for nearly half of these wells, as 26 wells were drilled on the land mass and adjacent waters of the Island. Prior gas discoveries at the Hecla and Drake fields (1969 to 1973) led to the further drilling of 10 wells on Sabine Peninsula, nine by Panarctic and one by Dome Petroleum. Five wells were drilled on the Peninsula in 1974 with two (Panarctic et al. Drake E-78 and Panarctic Drake Point D-68) completed as gas wells. In 1975, two additional onshore gas well completions were made at the Panarctic et al. Drake D-73 and Panarctic et al. East Hecla C-32 wellsites, while two other wells on the Peninsula were abandoned. Between 1976 and 1978, another seven wells were drilled and abandoned on Melville Island including two wells on the Sabine Peninsula, two in the vicinity of Hecla and Griper Bay, and one well on each of the east, south, and northwestern coasts. One well was drilled on a small island off the west coast of Sabine Peninsula.

Cameron Island was the second most intensively-explored area, with 11 onshore wells completed from 1974 to 1978. The Bent Horn area, the Island's southwest corner, received the most attention, with seven wells drilled (paired wells, such as the W. Bent Horn I-01, I-01A wells and Bent Horn F-72, F-72A wells, are counted as single wells); an additional four wells were drilled in the north and east regions of the island. One of the early Bent

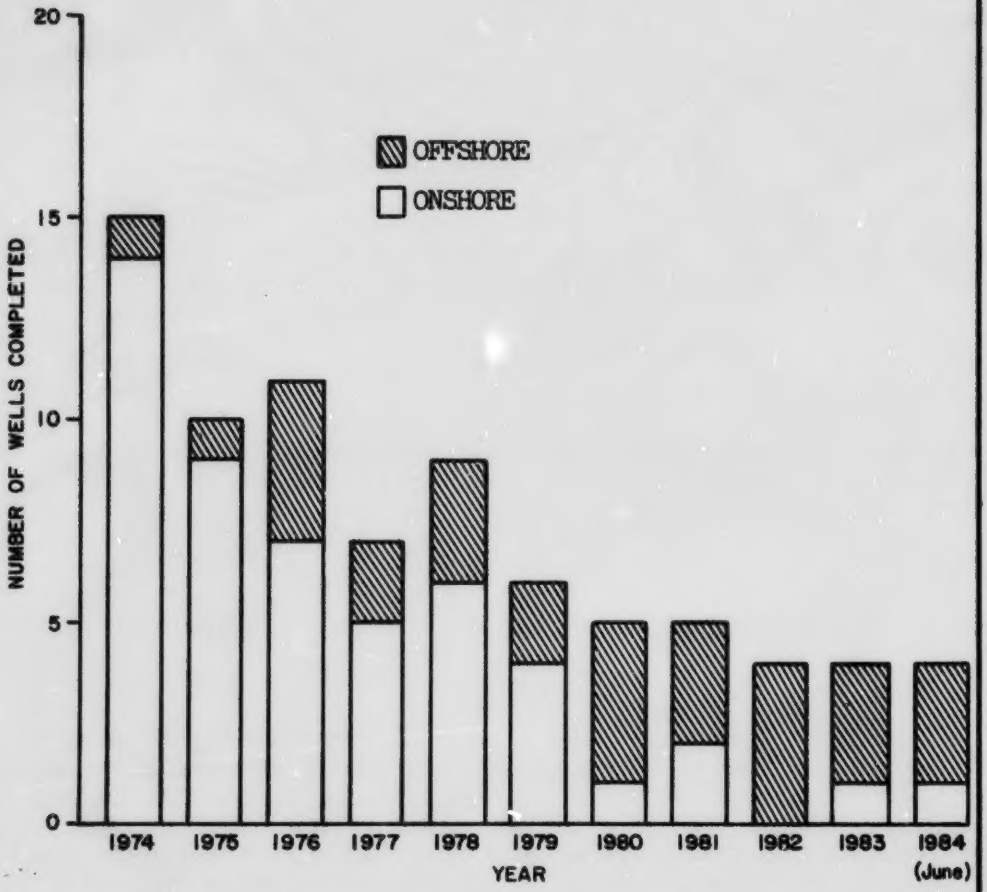
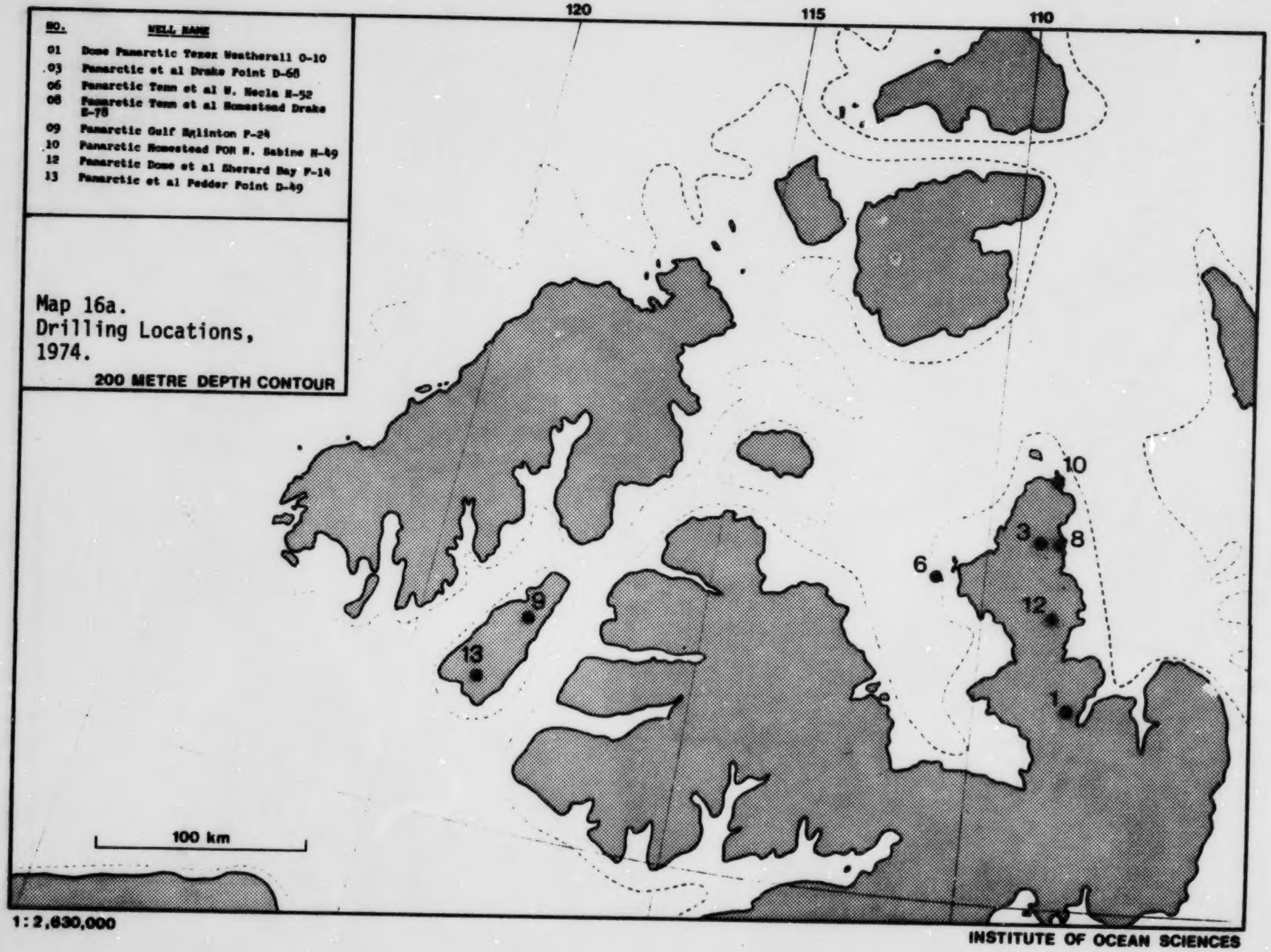


Figure 19. Annual Exploratory Drilling Activity by All Companies, 1974 to 1984.



NO.	WELL NAME
01	Dome Panarctic Tenneco Weatherall O-10
03	Panarctic et al Drake Point D-68
06	Panarctic Tenn et al W. Hecla N-52
08	Panarctic Tenn et al Homestead Drake E-78
09	Panarctic Gulf Eglinton P-24
10	Panarctic Homestead FOR N. Sabine H-49
12	Panarctic Dome et al Sherard Bay F-14
13	Panarctic et al Pedder Point D-49

Map 16a.
Drilling Locations,
1974.

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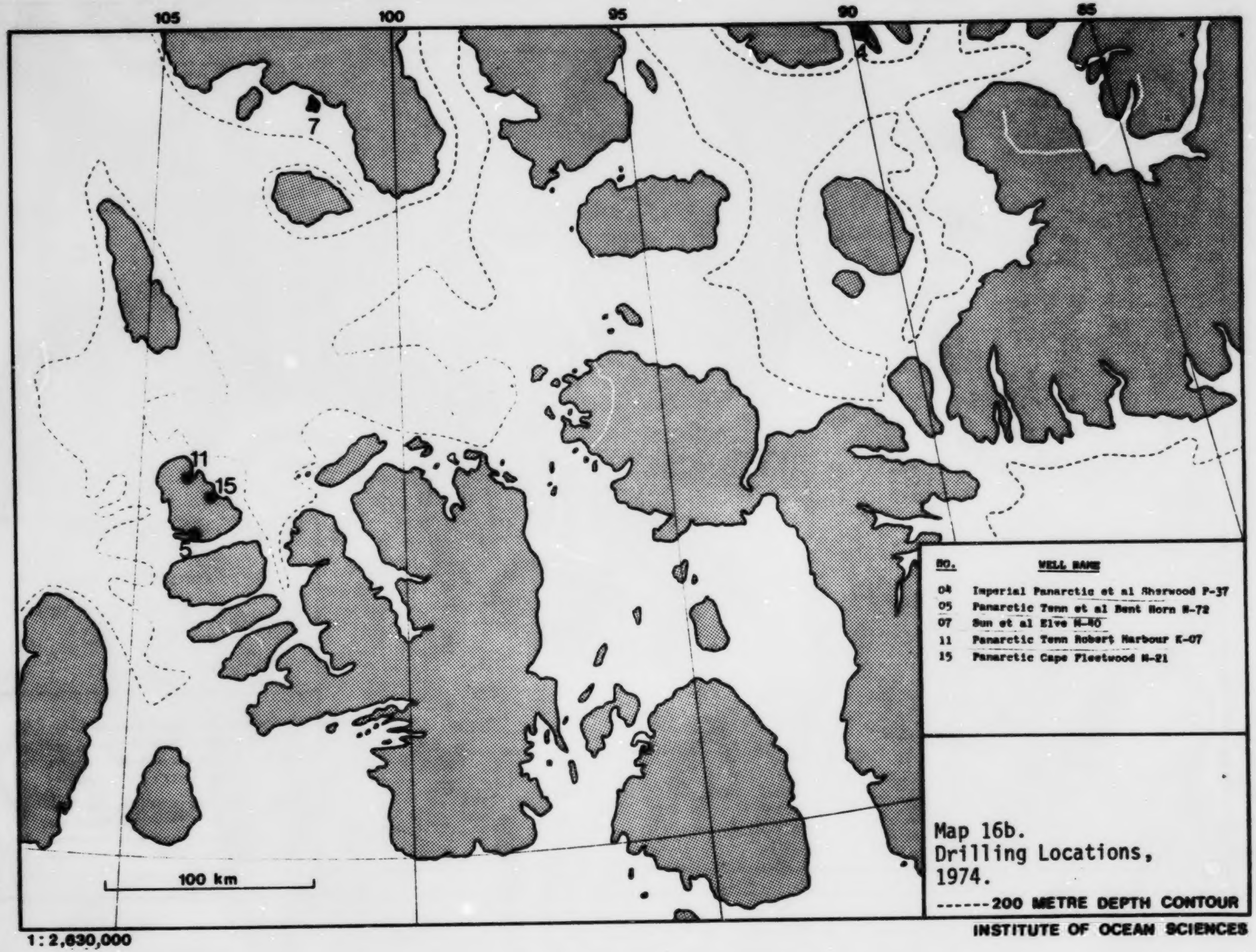

NO.	WELL NAME
04	Imperial Panarctic et al Sherwood P-37
05	Panarctic Tenn et al Bent Horn N-72
07	Sun et al Elve N-40
11	Panarctic Tenn Robert Harbour K-07
15	Panarctic Cape Fleetwood N-21

Map 16b.
Drilling Locations,
1974.

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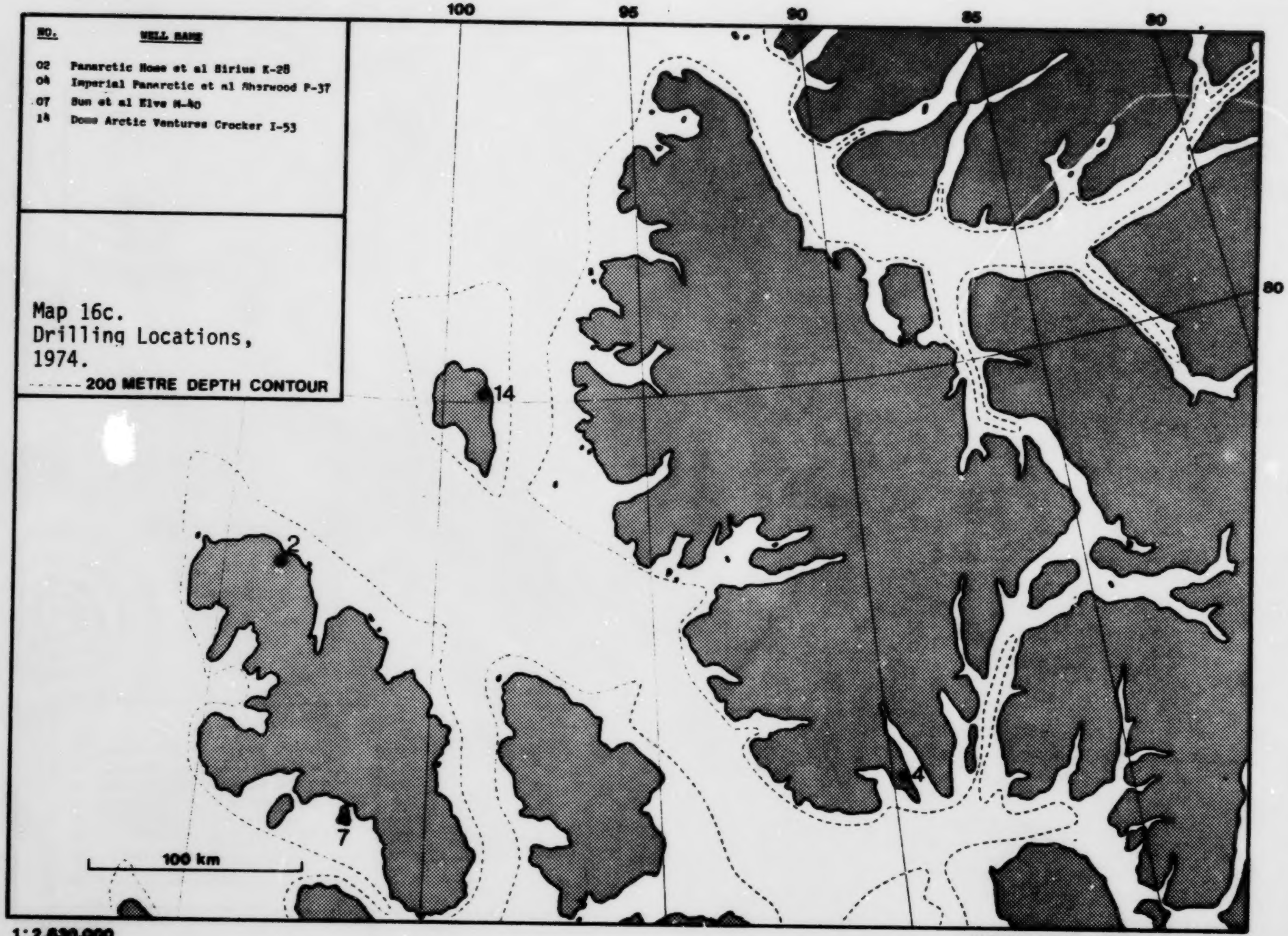

NO.	WELL NAME
02	Panarctic Home et al Sirius K-28
04	Imperial Panarctic et al Sherwood P-37
07	Sun et al Elve M-40
14	Dome Arctic Ventures Crocker I-53

Map 16c.
Drilling Locations,
1974.

------ 200 METRE DEPTH CONTOUR

1:2,630,000

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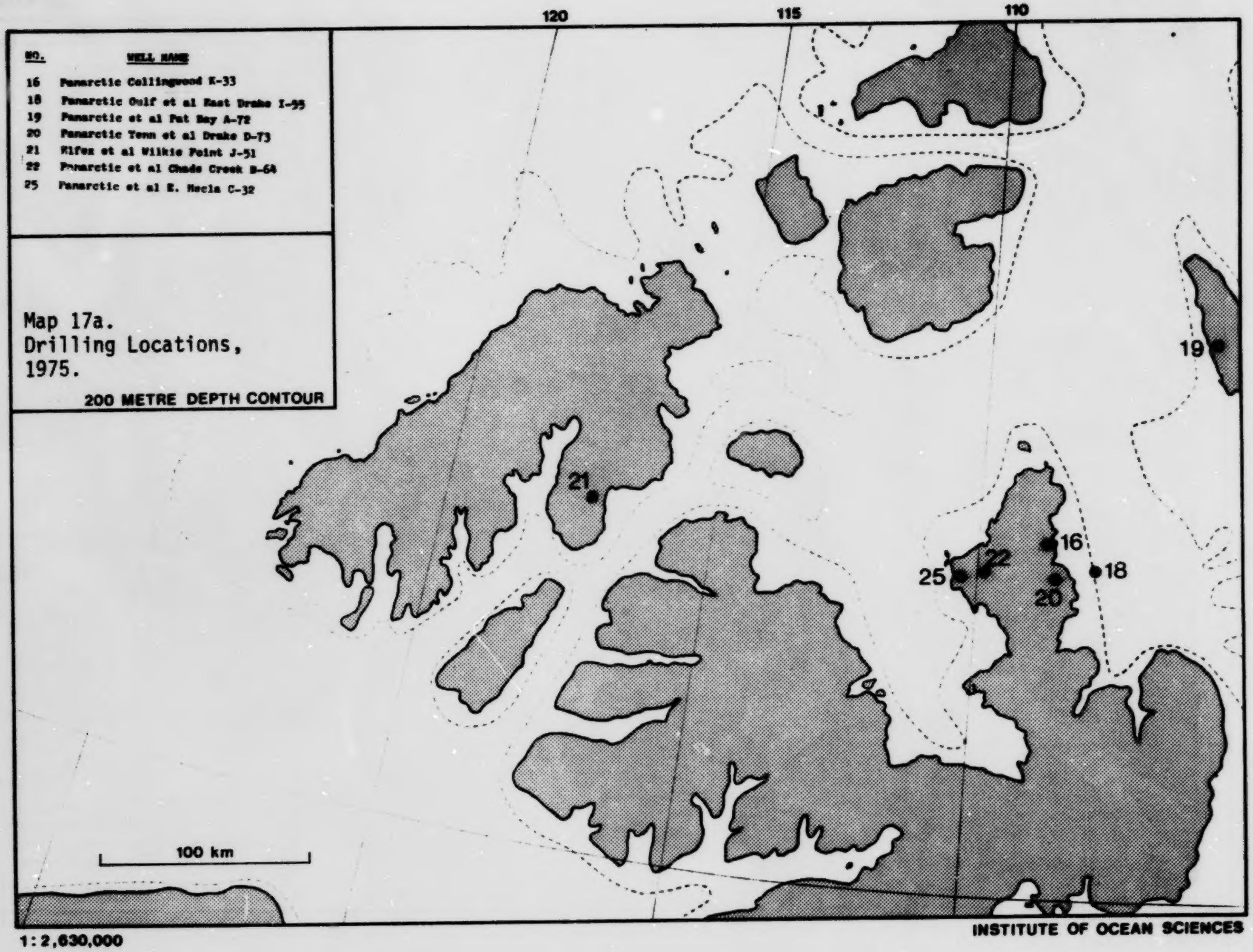
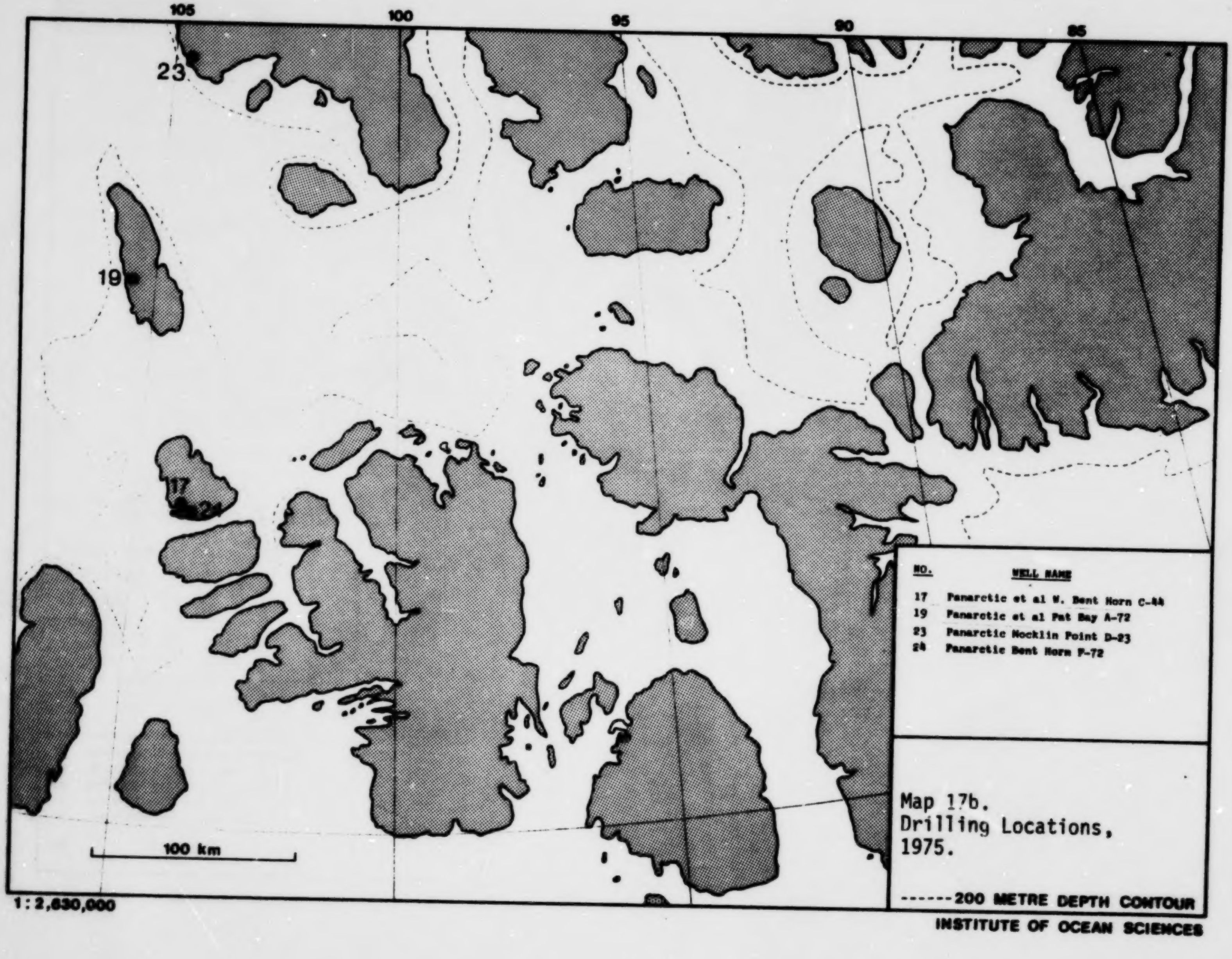


NO.	WELL NAME
16	Panarctic Collingwood K-33
18	Panarctic Gulf et al East Drake I-55
19	Panarctic et al Pat Bay A-72
20	Panarctic Tenn et al Drake D-73
21	Elfex et al Wilkie Point J-51
22	Panarctic et al Chads Creek B-64
25	Panarctic et al E. Hecla C-32

Map 17a.
Drilling Locations,
1975.



NO.	WELL NAME
17	Panarctic et al W. Bent Horn C-44
19	Panarctic et al Pat Bay A-72
23	Panarctic Hocklin Point D-23
24	Panarctic Bent Horn F-72

Map 17b.
Drilling Locations,
1975.

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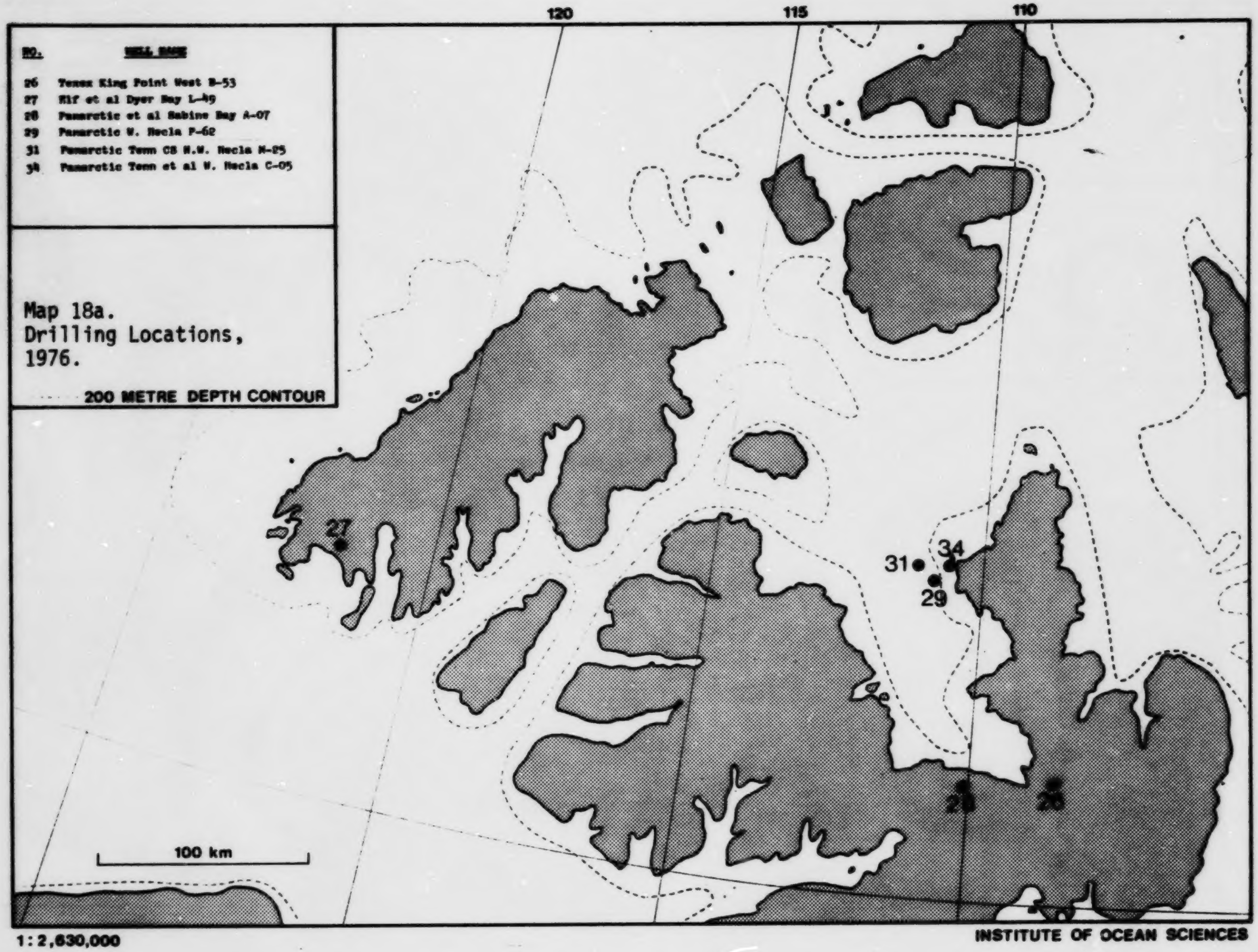
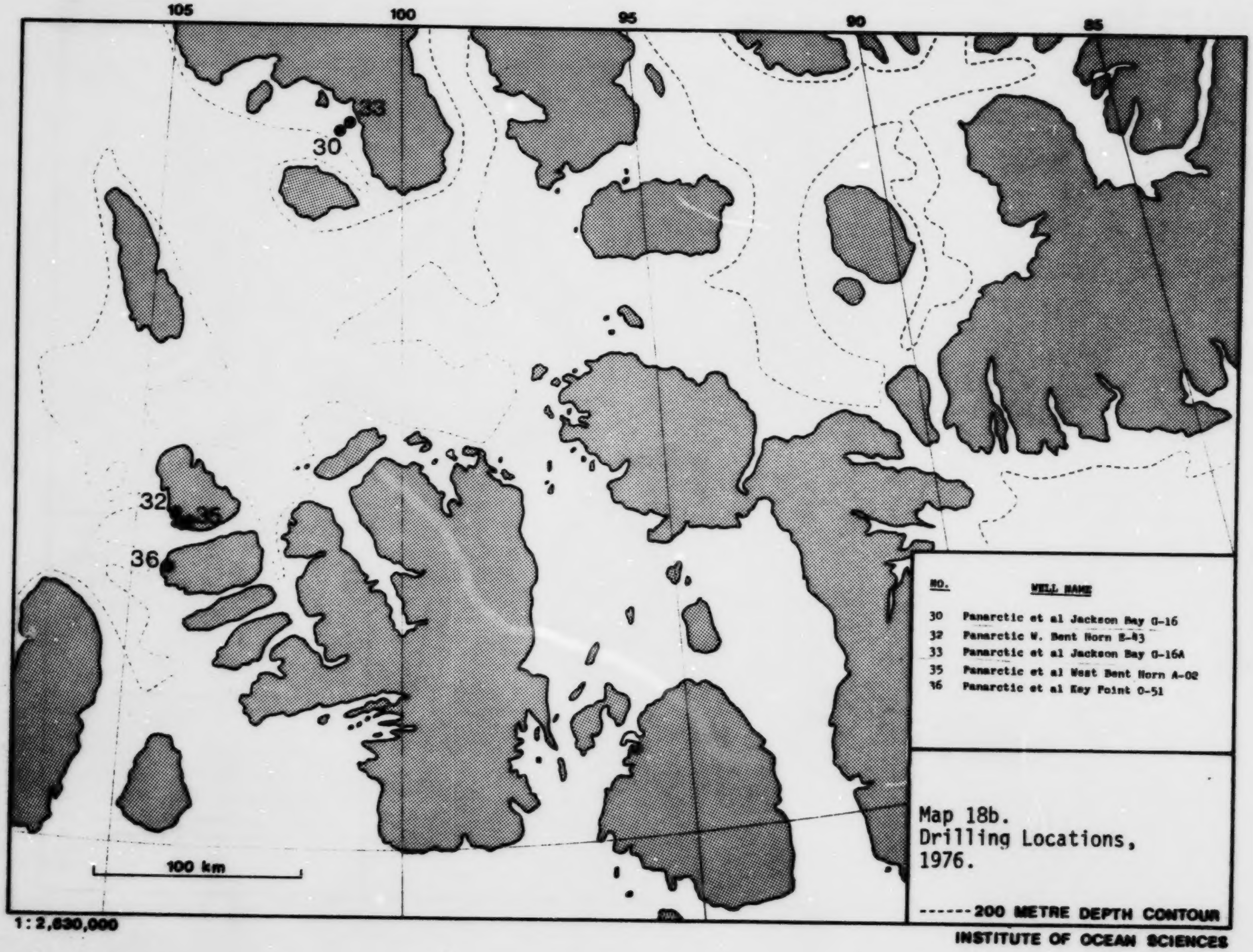


NO.	WELL NAME
26	Texex King Point West B-53
27	Elf et al Dyer Bay L-49
28	Panarctic et al Sabine Bay A-07
29	Panarctic W. Hecla P-62
31	Panarctic Tenn CS N.W. Hecla M-25
34	Panarctic Tenn et al W. Hecla C-05

Map 18a.
Drilling Locations,
1976.



NO.	WELL NAME
30	Panarctic et al Jackson Bay G-16
32	Panarctic W. Bent Horn E-43
33	Panarctic et al Jackson Bay G-16A
35	Panarctic et al West Bent Horn A-02
36	Panarctic et al Key Point O-51

Map 18b.
Drilling Locations,
1976.

------200 METRE DEPTH CONTOUR

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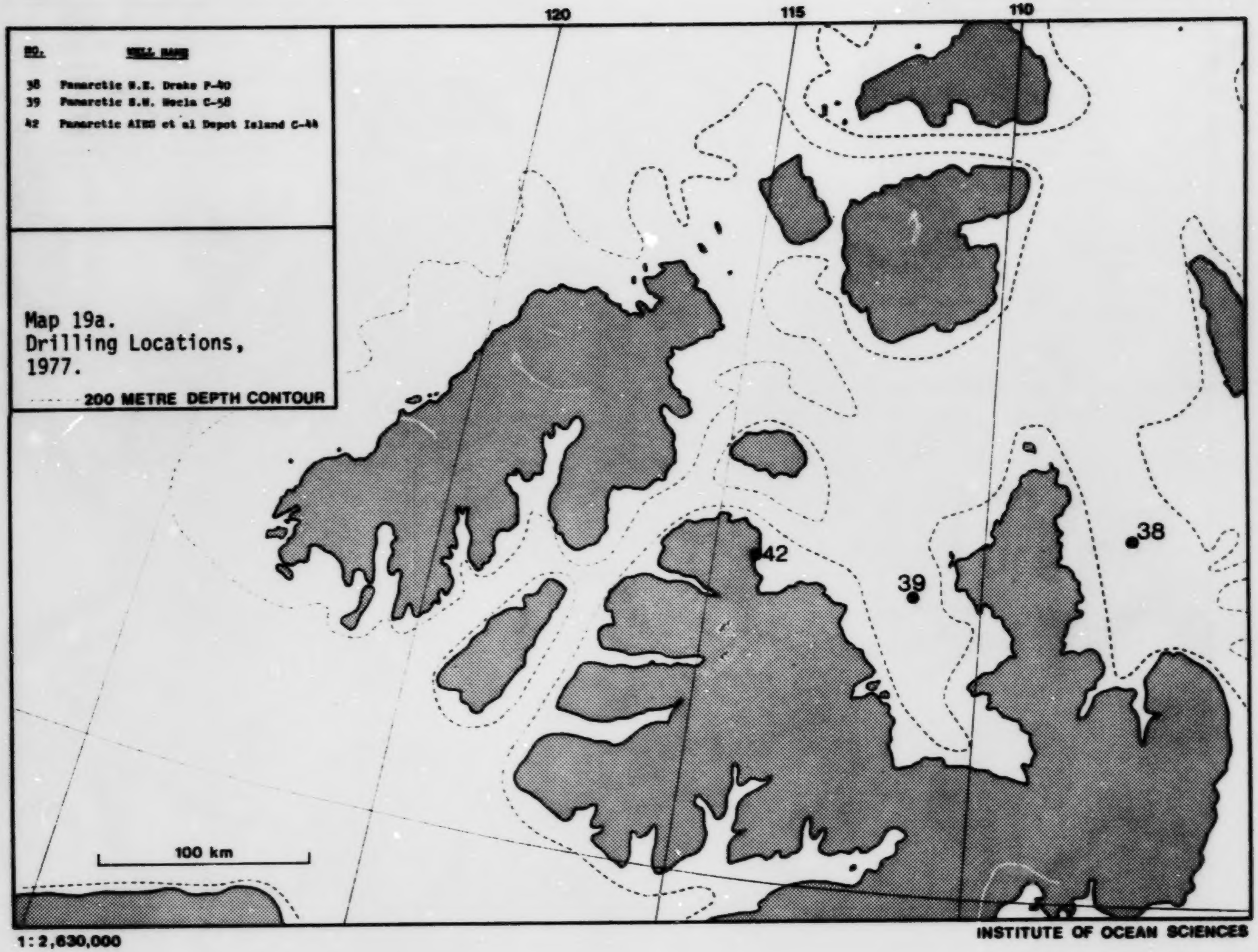

Map 19a.
Drilling Locations,
1977.

NO.
WELL NAME
38 Panarctic N.E. Drake P-40
39 Panarctic S.W. Hecla C-58
42 Panarctic AIEG et al Depot Island C-44
200 METRE DEPTH CONTOUR
120
115
110
38
39
42
100 km
1:2,630,000
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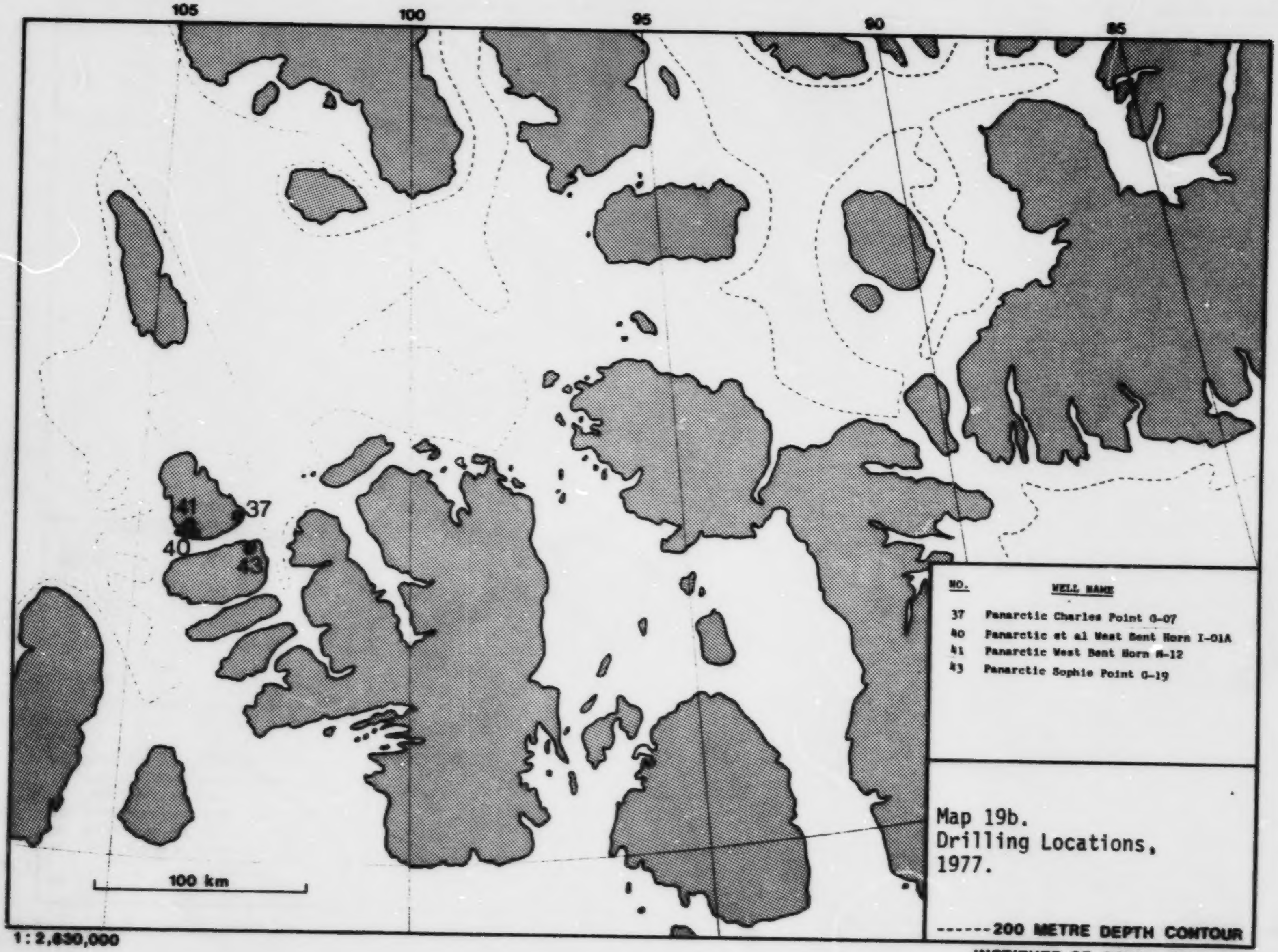

NO.	WELL NAME
37	Panarctic Charles Point G-07
40	Panarctic et al West Bent Horn I-01A
41	Panarctic West Bent Horn M-12
43	Panarctic Sophie Point G-19

Map 19b.
Drilling Locations,
1977.

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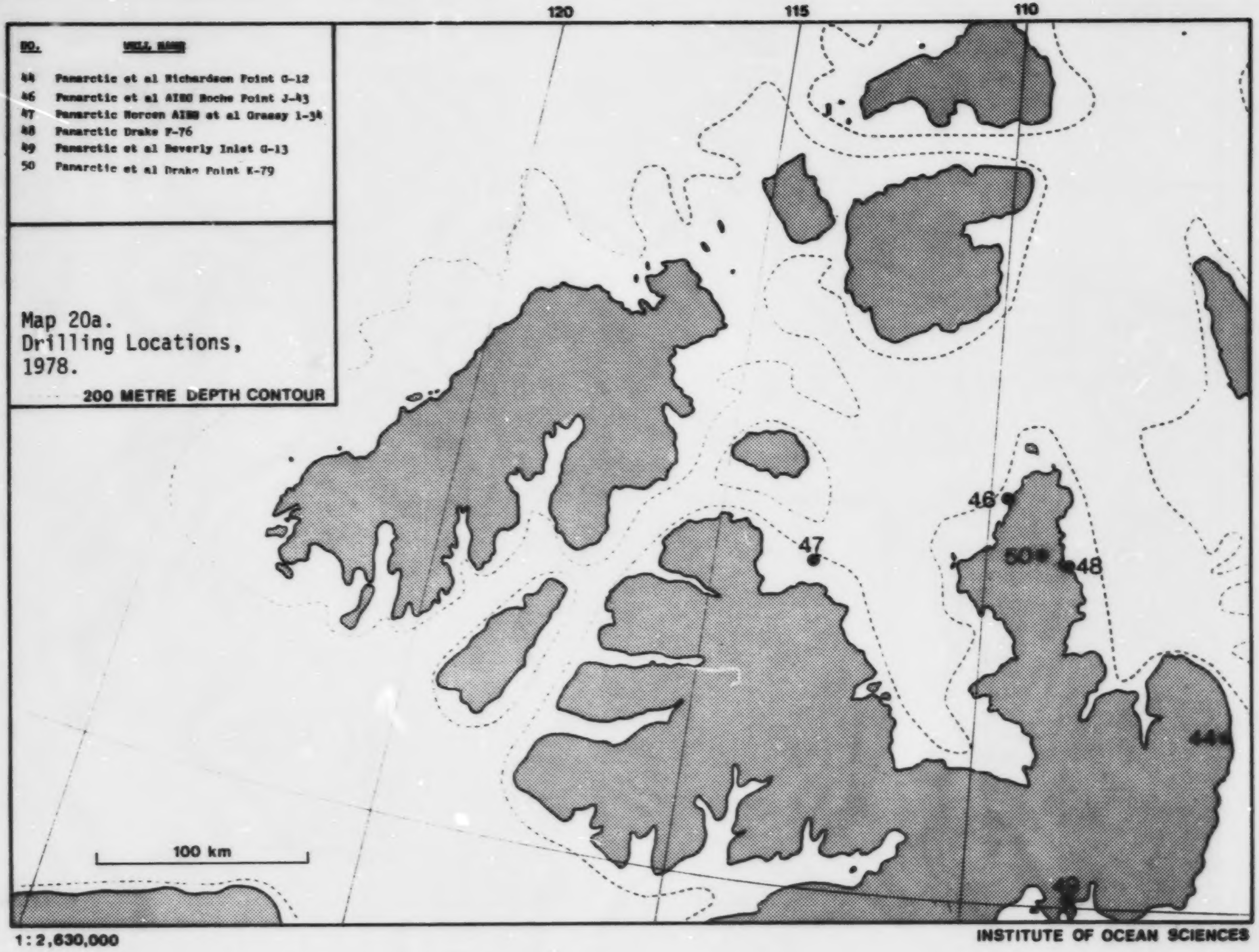
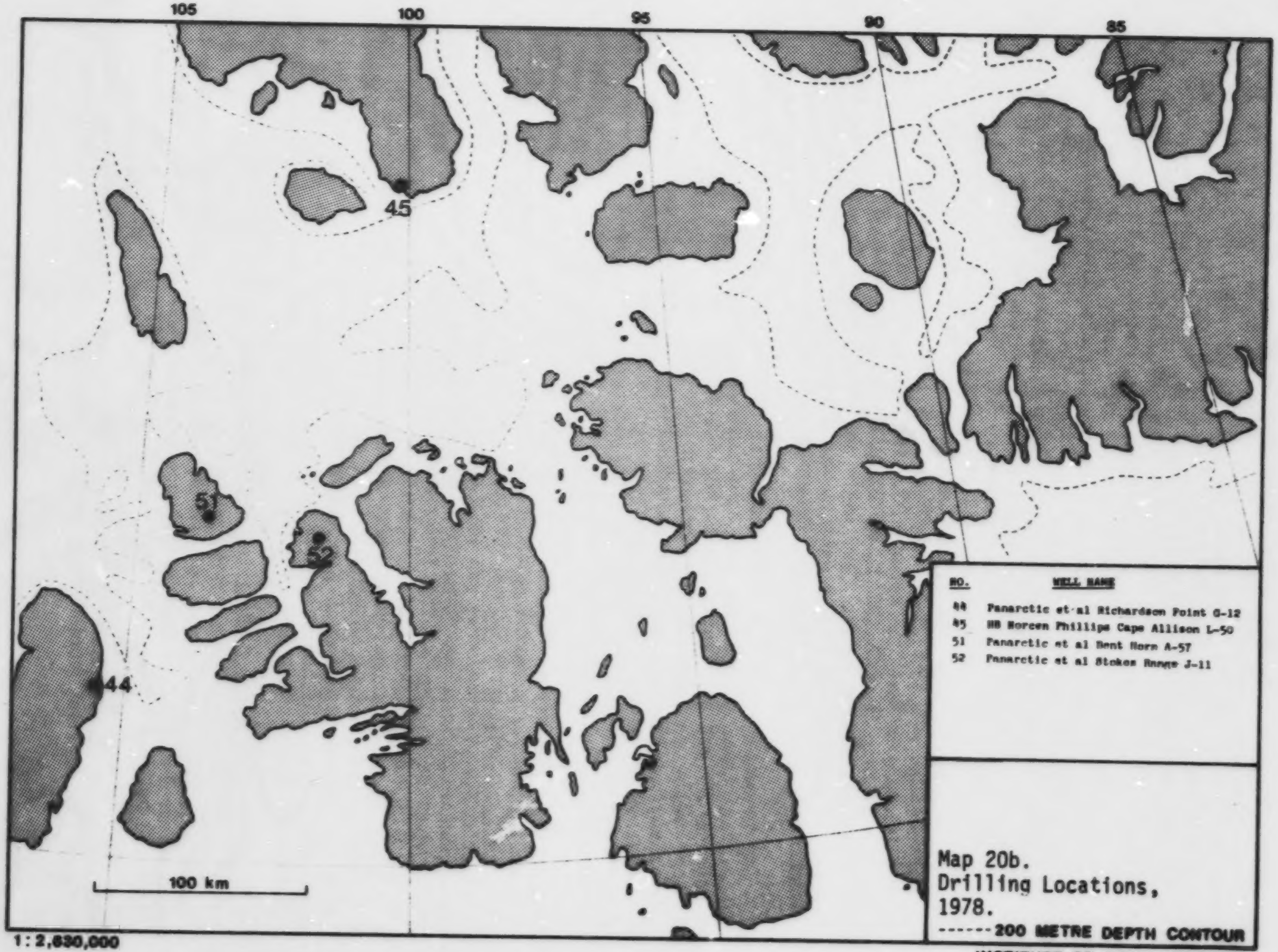


NO.	WELL NAME
44	Panarctic et al Richardson Point G-12
46	Panarctic et al AIEG Roche Point J-43
47	Panarctic Norcen AIEG et al Grassy 1-34
48	Panarctic Drake F-76
49	Panarctic et al Beverly Inlet G-13
50	Panarctic et al Drake Point K-79

Map 20a.
Drilling Locations,
1978.

200 METRE DEPTH CONTOUR



NO.	WELL NAME
44	Panarctic et al Richardson Point G-12
45	HB Norcen Phillips Cape Allison L-50
51	Panarctic et al Bent Horn A-57
52	Panarctic et al Stokes Range J-11

Map 20b.
Drilling Locations,
1978.

------200 METRE DEPTH CONTOUR

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Horn wells (Panarctic Tenneco et al. Bent Horn N-72) was the Sverdrup Basin's first oil discovery, with a tested flow rate of 80 m^3 per day in 1974. Spurred by this discovery, two wells were drilled at Bent Horn the following year, one of which (Panarctic Bent Horn F-72A) was completed as an oil well. In 1976, two more wells were drilled at Bent Horn, and one well (Panarctic et al. W. Bent Horn A-02) was completed with a tested oil flow rate of 950 m^3 per day. The other well (Panarctic W. Bent Horn E-43) recovered high gravity oil, but was abandoned. Following these initial successes, four more wells were drilled on Cameron Island in 1977 and 1978, three at Bent Horn, and one on the east side of the Island; however, all were plugged and abandoned.

Some attention was given to Ellef Ringnes Island during this period, where two wells were drilled by Panarctic and one each by Sunoco and Hudson Bay Oil and Gas. Two wells were drilled in 1974 by Panarctic and Sunoco on the northern and southern tips of the Island, while two wells were drilled on the western peninsula of the Island in 1975 and 1978 by Panarctic and Hudson Bay Oil and Gas respectively. Other onshore areas explored include: Axel Heiberg Island (one well by Imperial Oil in 1974); King Christian Island (one well by Dome Petroleum in 1974); Eglinton Island (two wells by Panarctic in 1974); Prince Patrick Island (two wells by Elfex Canada in 1975 and 1976); Lougheed Island (one well by Panarctic in 1975); Vanier Island (two wells by Panarctic in 1976 and 1977); and Bathurst Island (one well by Panarctic in 1978).

The successful use of a built-up ice platform at the Hecla N-52 wellsite enabled Panarctic to undertake offshore delineation drilling in the vicinity of onshore oil and gas fields and to begin offshore "wildcat" drilling. Nine offshore wells were drilled by Panarctic to the east and west of Sabine Peninsula to delineate the Drake and Hecla gas fields, respectively. The first two offshore wells drilled by Panarctic (Panarctic W. Hecla N-52 in 1974 and Panarctic East Drake I-55 in 1975) resulted in gas discoveries and extended the Hecla and Drake fields to the west and east of the Sabine Peninsula. Two offshore wells were drilled in the Hecla area in 1976, with both wells (Panarctic W. Hecla P-62 and N.W. Hecla M-25) successfully delineating the field to the north and northeast. The following year, a fifth gas discovery was made at an offshore well drilled in the Hecla field (Panarctic S.W. Hecla C-58), while a second offshore well in the Drake area was abandoned. In 1978, Panarctic completed an experimental subsea natural gas production system at its Drake F-76 wellsite (see Section 5.3.4). A second offshore well, east of the Sabine Peninsula, was abandoned.

Only three offshore wells were drilled outside of the Sabine Peninsula area during this period. Two wells were drilled in Jackson Bay, Ellef Ringnes Island in 1976 with one well (Panarctic et al. Jackson Bay G-16) resulting in a gas discovery. The other offshore well, drilled in 1978 near Cape Grassy on northwestern Melville Island, was abandoned.

5.5.3.2 Drilling activities, 1979 to 1984

Since 1978, the focus of drilling operations has been directed to offshore exploration in the central Sverdrup Basin. Twenty-one of 28 wells completed between January 1979 and June 1984 were offshore wells concentrating on the areas to the west of Lougheed Island and within Maclean and Danish straits, with isolated wells in the Desbarats and Hazen straits. Onshore exploration drilling during this period included: wells on Ellef Ringnes,

Table 6. Exploration and Delineation Drilling Activities, 1979 to 1984.

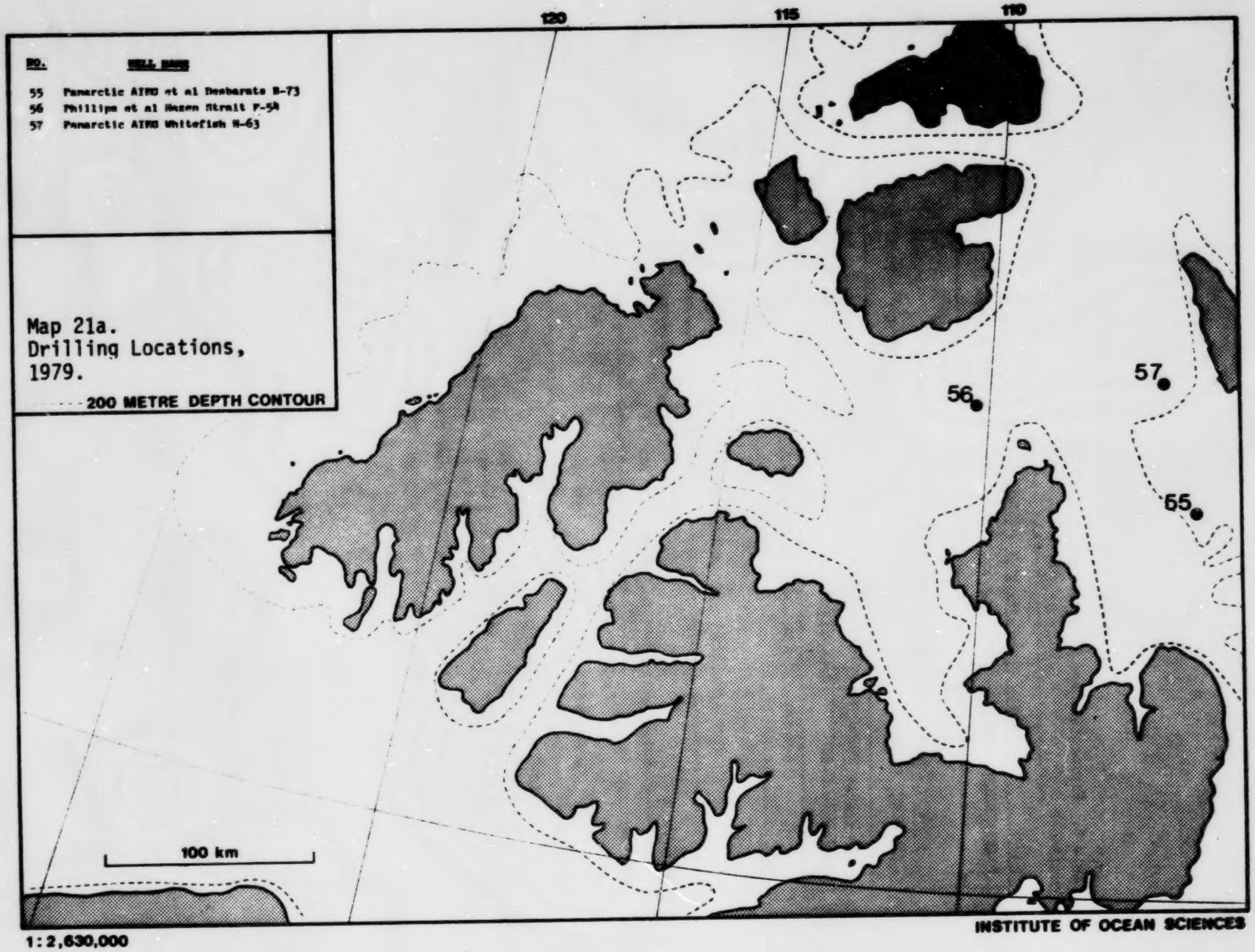
WELL NAME	AREA	DRILLING PERIOD	STATUS
Panarctic et al Noice D-41	Ellef Ringnes Island	04 Nov. 1978 - 02 Jan. 1979	Abandoned
Dome Panarctic et al Hoodoo E-05	Ellef Ringnes Island	08 Nov. 1978 - 03 Jan. 1979	Abandoned
Panarctic AIEG et al Desbarats B-73	Byam Martin Channel	17 Feb. 1979 - 27 Mar. 1979	Abandoned
Phillips et al Hazen Strait F-54	Hazen Strait	11 Feb. 1979 - 12 May 1979	Abandoned
Panarctic AIEG Whitefish H-63	West of Lougheed Island	18 Oct. 1978 - 17 May 1979	Gas Discovery
Mobil Cornwall O-30	Cornwall Island	05 June 1979 - 14 Oct. 1979	Abandoned
Panarctic AIEG Dome PPC Char G-07	Danish Strait	05 Feb. 1979 - 22 Apr. 1980	Oil and Gas Discovery
Panarctic AIEG PPC Balaena D-58	Danish Strait	06 Feb. 1980 - 27 Apr. 1980	Non-commercial Oil Discovery
Panarctic AIEG Whitefish 2H-63	West of Lougheed Island	03 Dec. 1979 - 15 May 1980	Gas Well
Dome Wallis H-73	King Christian Island	16 Mar. 1980 - 23 Aug. 1980	Abandoned
Panarctic AIEG Vesey A-27	Vesey Hamilton Island	08 June 1980 - 09 Sept. 1980	Abandoned
Panarctic AIEG PPC Dome Skate B-80	Maclean Strait	20 Feb. 1981 - 04 Apr. 1981	Oil and Gas Discovery
Panarctic AIEG Phillips Cisco B-66	West of Lougheed Island	01 Feb. 1981 - 04 May 1981	Oil and Gas Discovery

Table 6. Exploration and Delineation Drilling Activities, 1979 to 1984. continued

WELL NAME	AREA	DRILLING PERIOD	STATUS
Panarctic AIEG PPC Dome Maclean I-72	West of Lougheed Island	27 Jan. 1981 - 04 May 1981	Oil and Gas Discovery
Panarctic W. Bent Horn G-02	Cameron Island	29 May 1981 - 04 Sept. 1981	Abandoned
Panarctic Dome et al Hoodoo N-52	Ellef Ringnes Island	29 Sept 1981 - 11 Nov. 1981	Abandoned
Panarctic et al Cisco C-42	West of Lougheed Island	02 Mar. 1982 - 20 Apr. 1982	Oil Well
Panarctic et al Cape Mamen F-24	SE of Mackenzie King Island	15 Jan. 1982 - 28 Apr. 1982	Abandoned
Panarctic et al Whitefish A-26	West of Lougheed Island	15 Jan. 1982 - 30 Apr. 1982	Abandoned
Panarctic et al Sculpin K-08	Maclean Strait	29 Jan. 1982 - 03 May 1982	Gas Discovery
Panarctic et al Cisco K-58	West of Lougheed Island	12 Dec. 1982 - 01 Feb. 1983	Oil Well
Panarctic et al Cape Macmillan 2K-15	South of Ellef Ringnes Island	03 Feb. 1983 - 12 Apr. 1983	Oil and Gas Discovery
Panarctic et al Grenadier A-26	South of Ellef Ringnes Island	11 Jan. 1983 - 17 Apr. 1983	Abandoned
Panarctic et al Maryatt Point K-71	Sabine Peninsula (Melville Island)	14 Oct. 1982 - 17 July 1983	Abandoned
Panarctic et al Cisco M-22	West of Lougheed Island	22 Jan. 1984 - 12 Apr. 1984	Abandoned
Panarctic et al Skate C-59	Maclean Strait	15 Jan. 1984 - 13 Apr. 1984	Gas Well

Table 6. Exploration and Delineation Drilling Activities, 1979 to 1984. continued

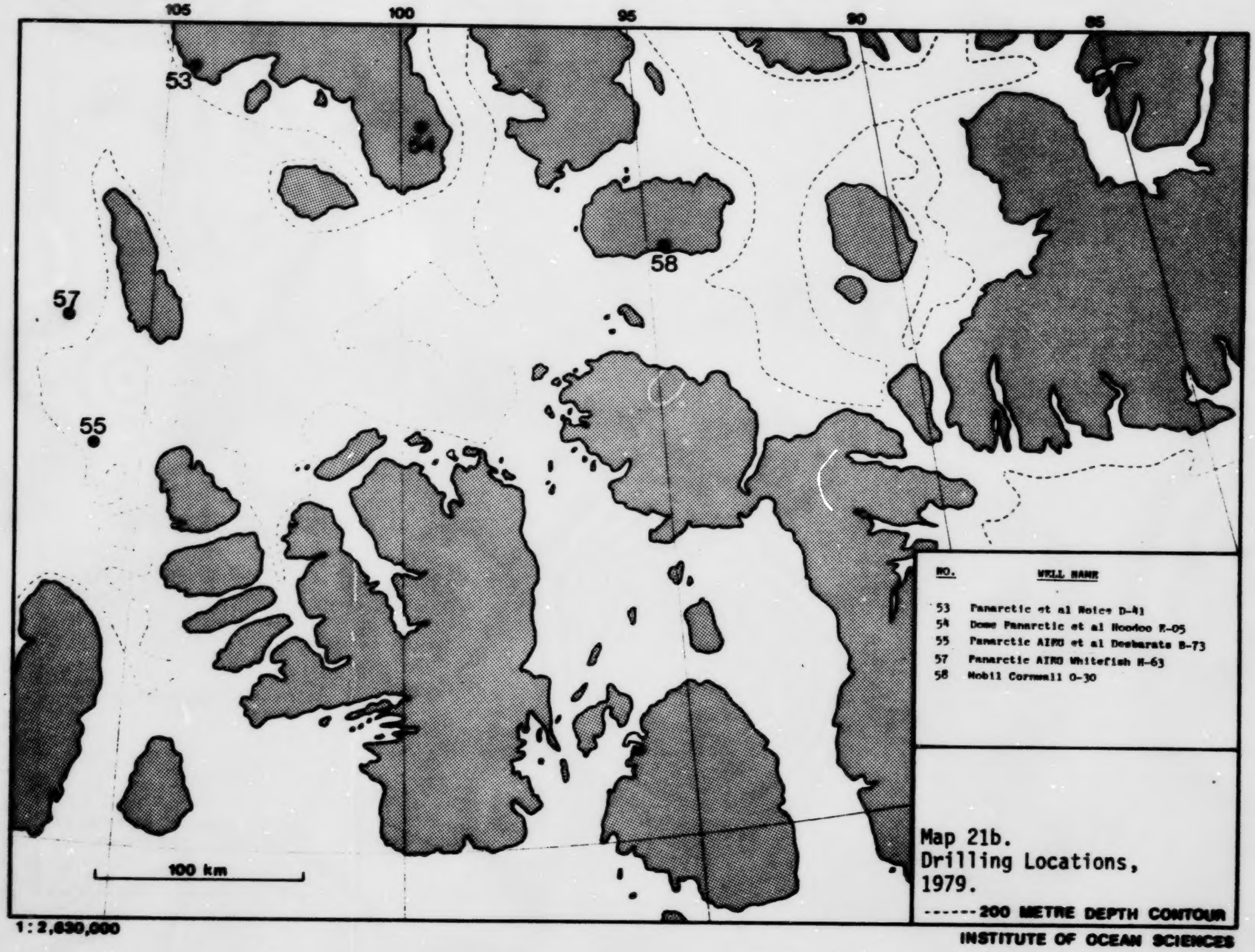
WELL NAME	AREA	DRILLING PERIOD	STATUS
Panarctic et al Sherard Bay F-34	Sabine Peninsula (Melville Island)	08 Oct. 1983 - 01 May 1984	Abandoned
Panarctic et al Buckingham O-68	Norwegian Bay	17 Feb. 1984 - 14 May 1984	Abandoned



NO.	WELL NAME
55	Panarctic AIRO et al Desbarats B-73
56	Phillips et al Hazen Strait F-54
57	Panarctic AIRO Whitefish H-63

Map 21a.
Drilling Locations,
1979.

------ 200 METRE DEPTH CONTOUR



NO.	WELL NAME
53	Panarctic et al Noice D-41
54	Dome Panarctic et al Hoodoo K-05
55	Panarctic AIRO et al Desbarats B-73
57	Panarctic AIRO Whitefish H-63
58	Mobil Cornwall O-30

Map 21b.
Drilling Locations,
1979.

------200 METRE DEPTH CONTOUR

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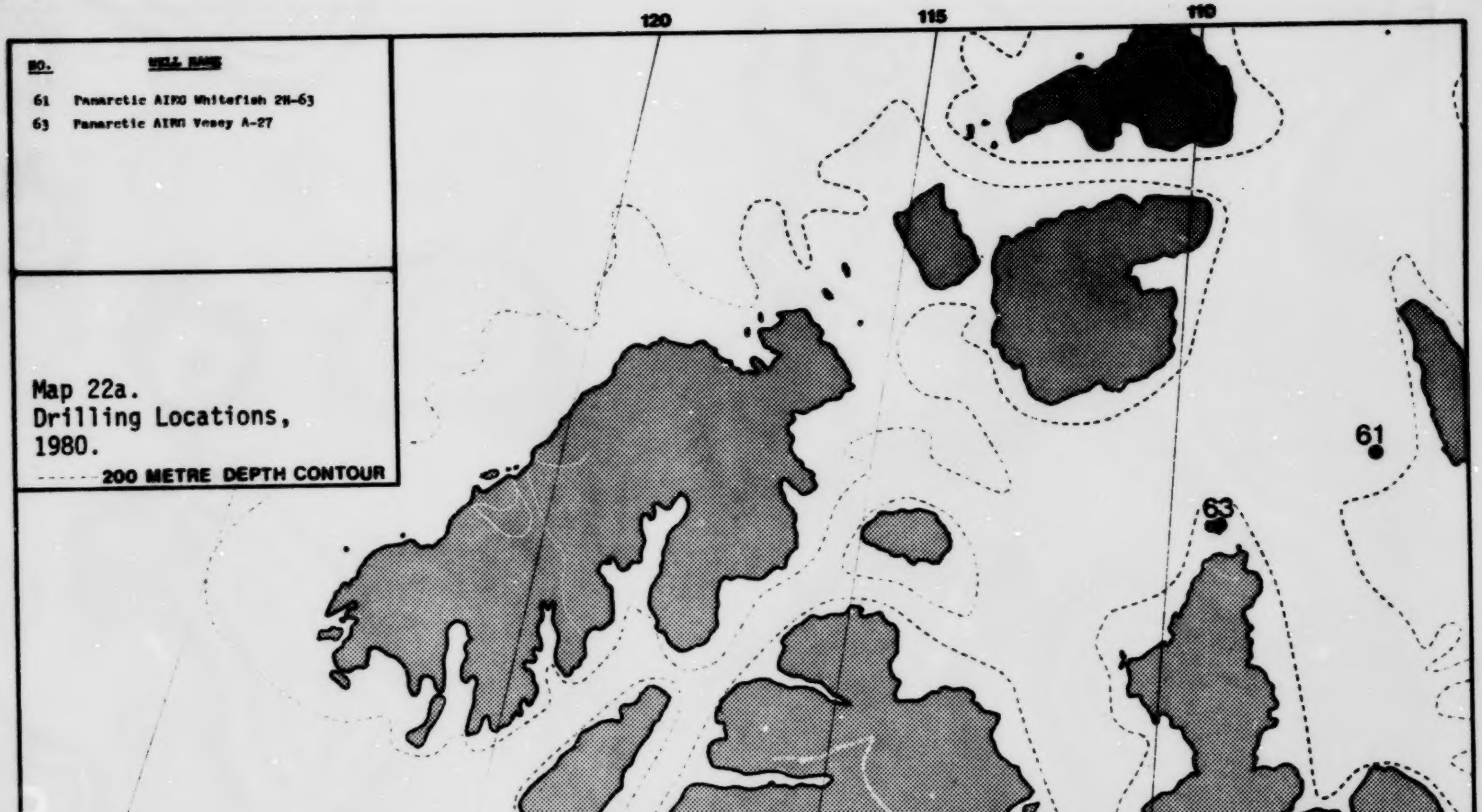
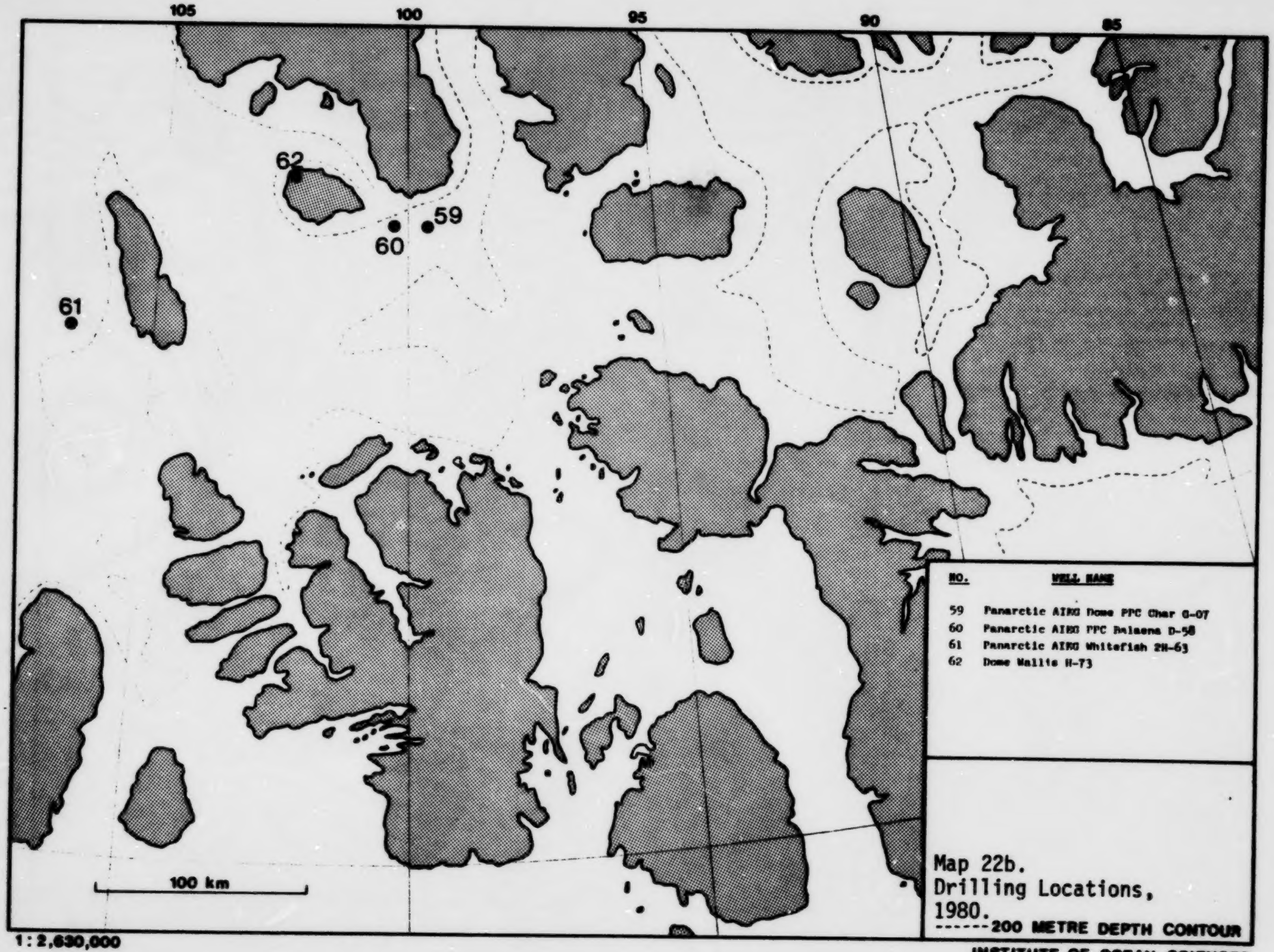


NO.	WELL NAME
61	Panarctic AIRG Whitefish 2H-63
63	Panarctic AIRG Vesey A-27

Map 22a.
Drilling Locations,
1980.



NO.	WELL NAME
59	Panarctic AIRG Dome PPC Char G-07
60	Panarctic AIRG PPC Balaena D-58
61	Panarctic AIRG Whitefish 2H-63
62	Dome Wallis H-73

Map 22b.
Drilling Locations,
1980.
------200 METRE DEPTH CONTOUR

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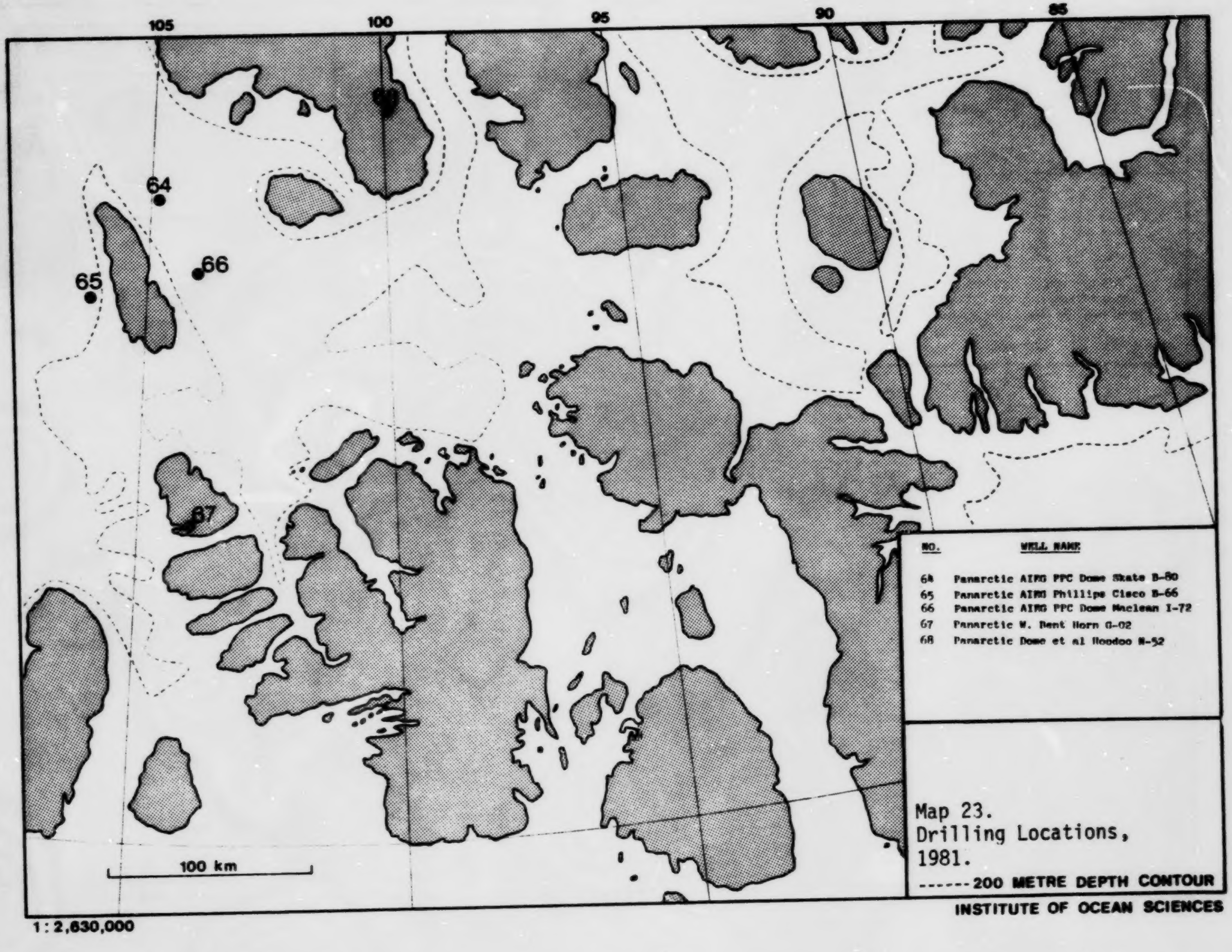

NO.	WELL NAME
64	Panarctic AIRG PPC Dome Skate B-80
65	Panarctic AIRG Phillips Cisco B-66
66	Panarctic AIRG PPC Dome Maclean I-72
67	Panarctic W. Bent Horn G-02
68	Panarctic Dome et al Hoodoo N-52

Map 23.
Drilling Locations,
1981.

------200 METRE DEPTH CONTOUR

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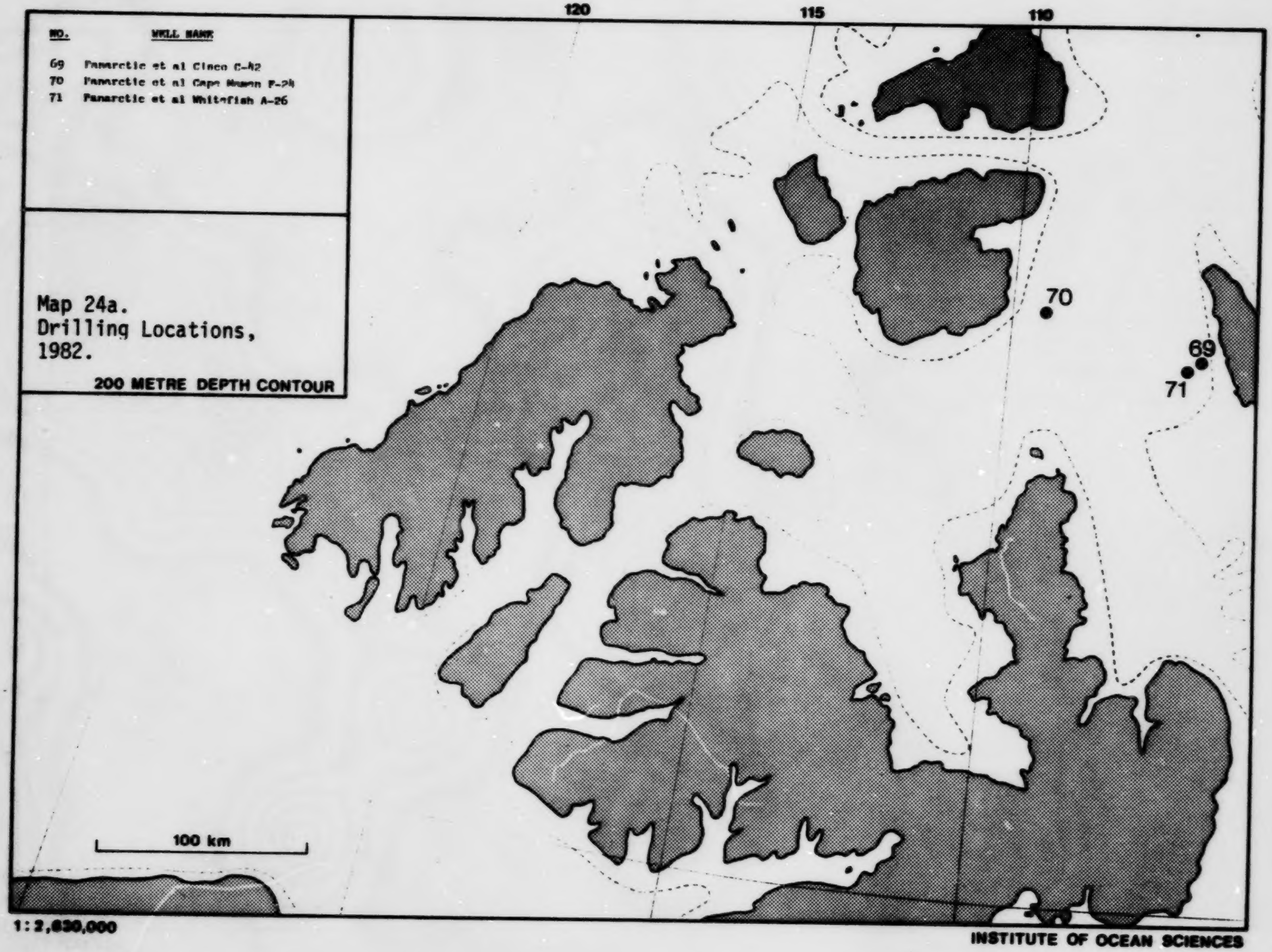
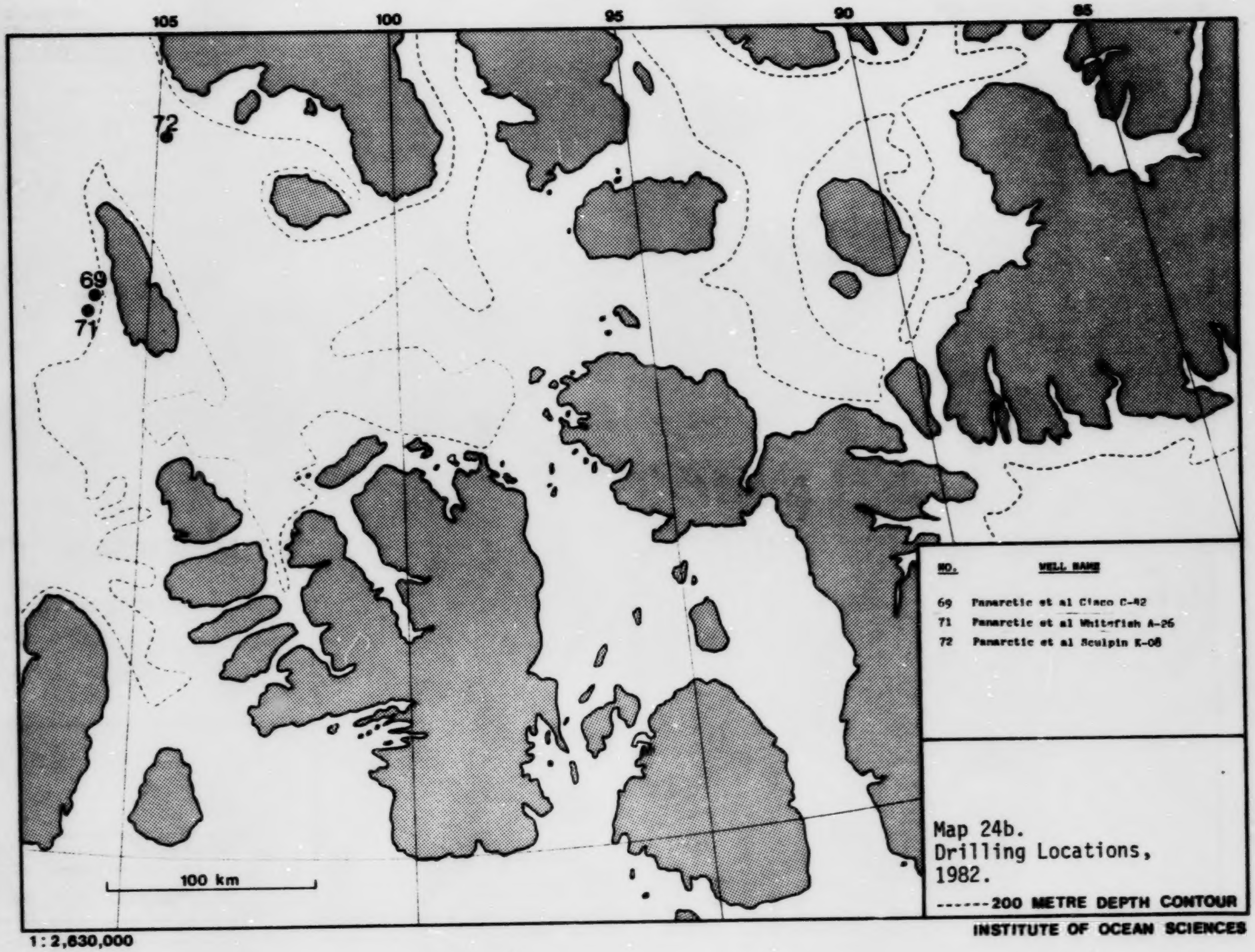


NO.	WELL NAME
69	Panarctic et al Cisco C-42
70	Panarctic et al Cape Mamen F-24
71	Panarctic et al Whitefish A-26

Map 24a.
Drilling Locations,
1982.



NO.	WELL NAME
69	Panarctic et al Cisco C-42
71	Panarctic et al Whitefish A-26
72	Panarctic et al Sculpin K-08

Map 24b.
Drilling Locations,
1982.

------200 METRE DEPTH CONTOUR

1:2,630,000

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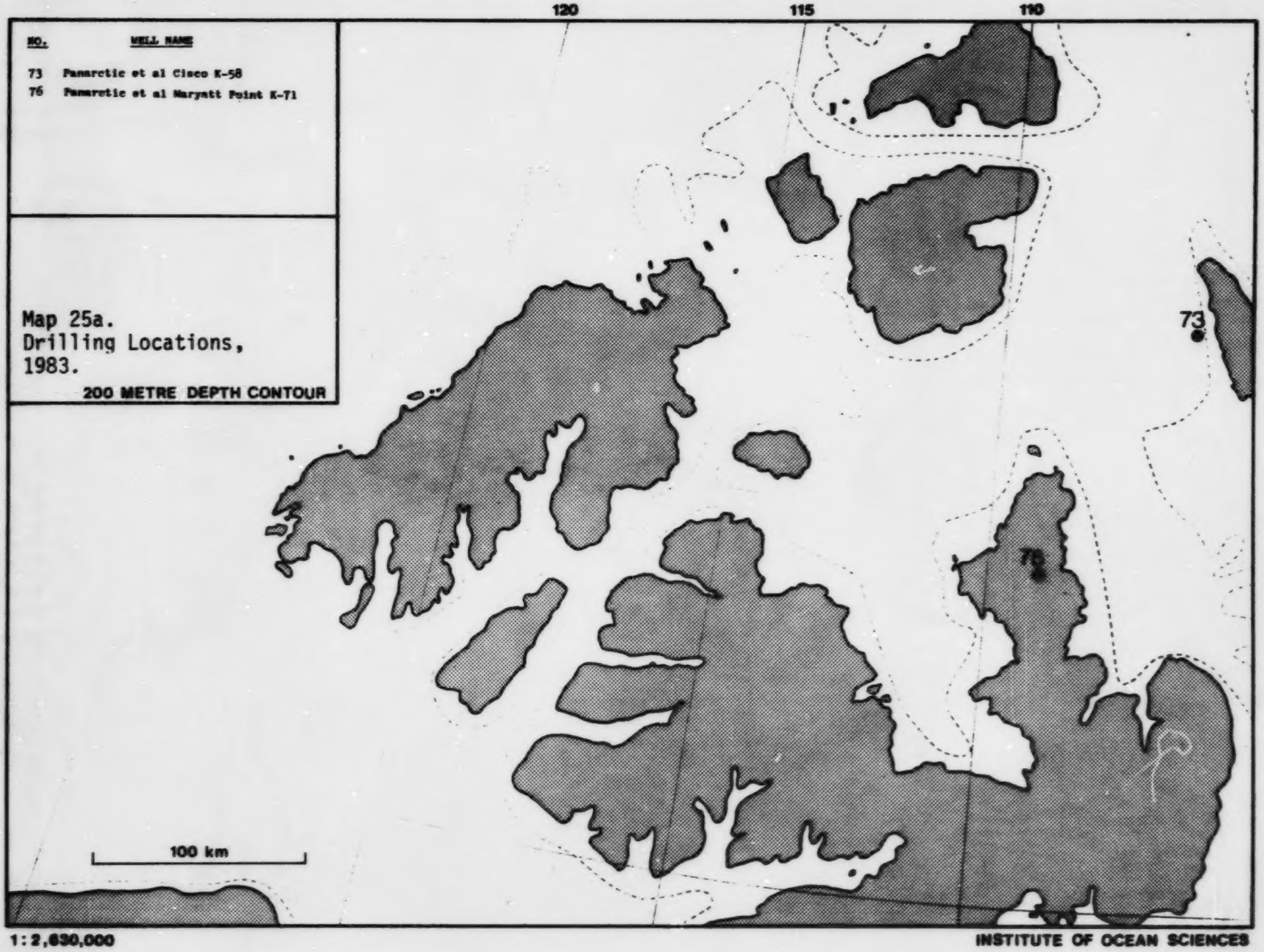
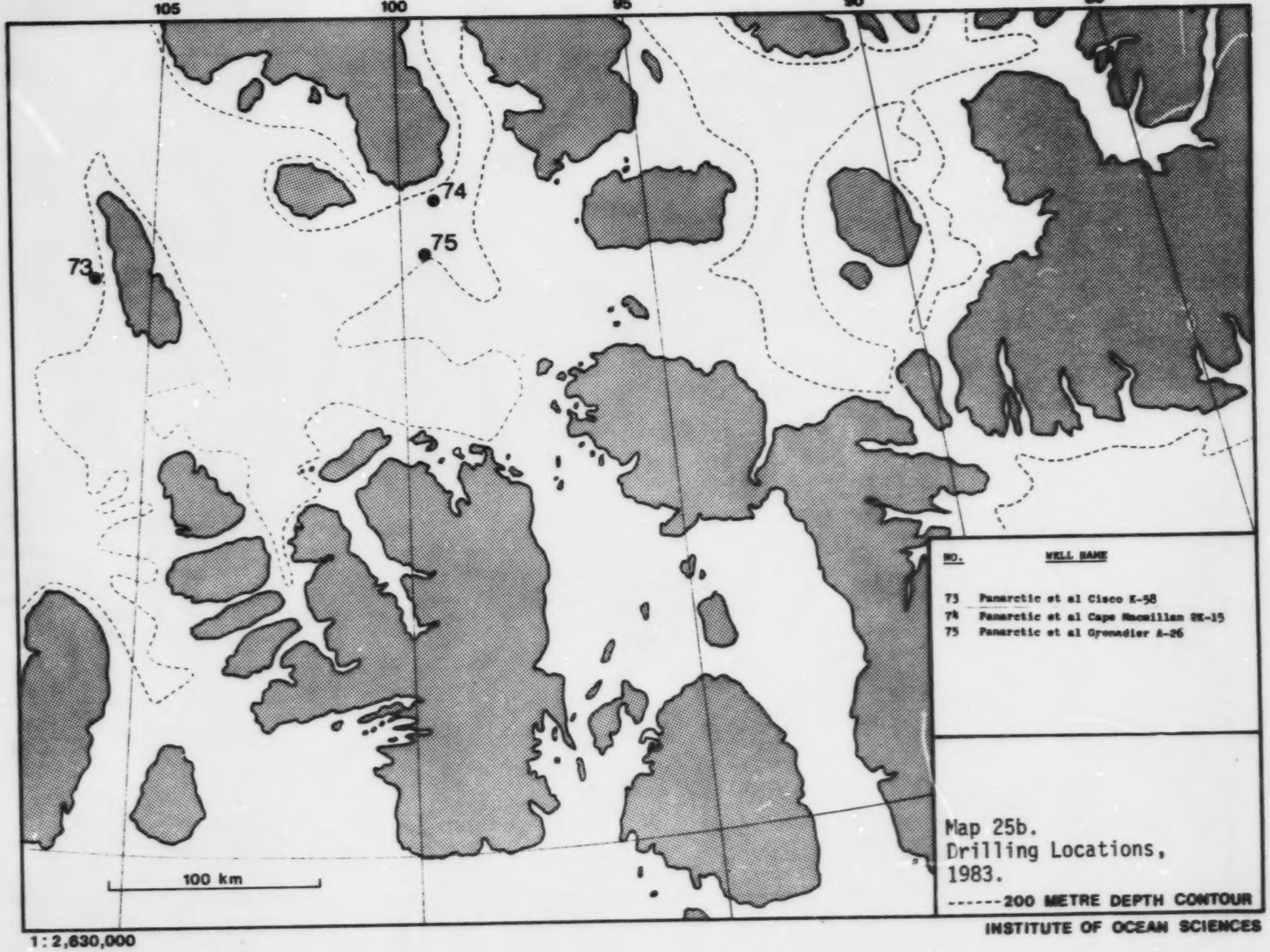


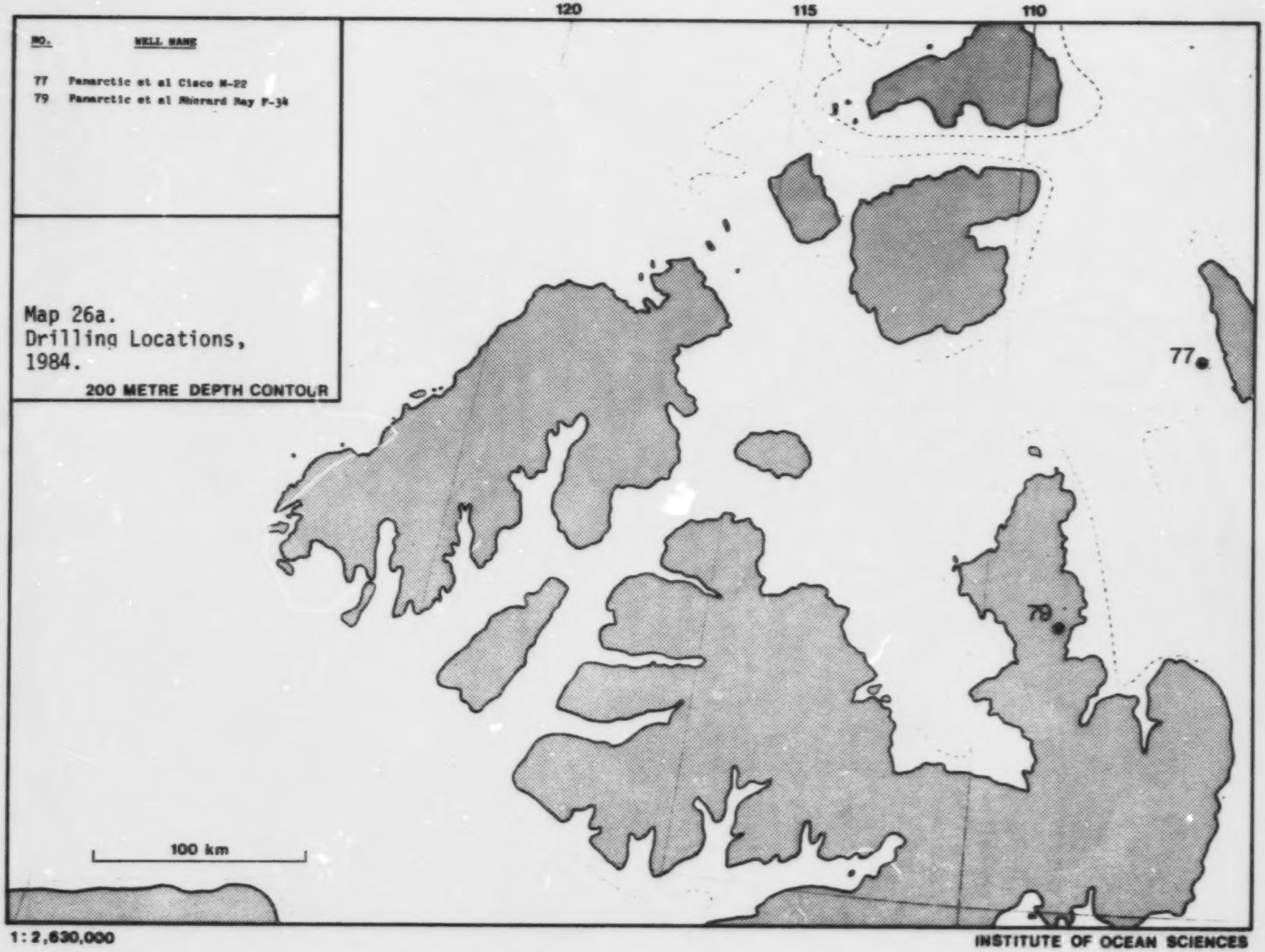
Map 25a.
Drilling Locations,
1983.

NO.	WELL NAME
73	Panarctic et al Cisco K-58
76	Panarctic et al Maryatt Point K-71



NO.	WELL NAME
73	Panarctic et al Cisco K-58
74	Panarctic et al Cape Macmillan 2K-15
75	Panarctic et al Grenadier A-26

Map 25b.
Drilling Locations,
1983.



Map 26a.
Drilling Locations,
1984.

NO.
WELL NAME
77 Panarctic et al Cisco M-22
79 Panarctic et al Sherard Bay F-34
200 METRE DEPTH CONTOUR
120
115
110
77
79
100 km
1:2,630,000
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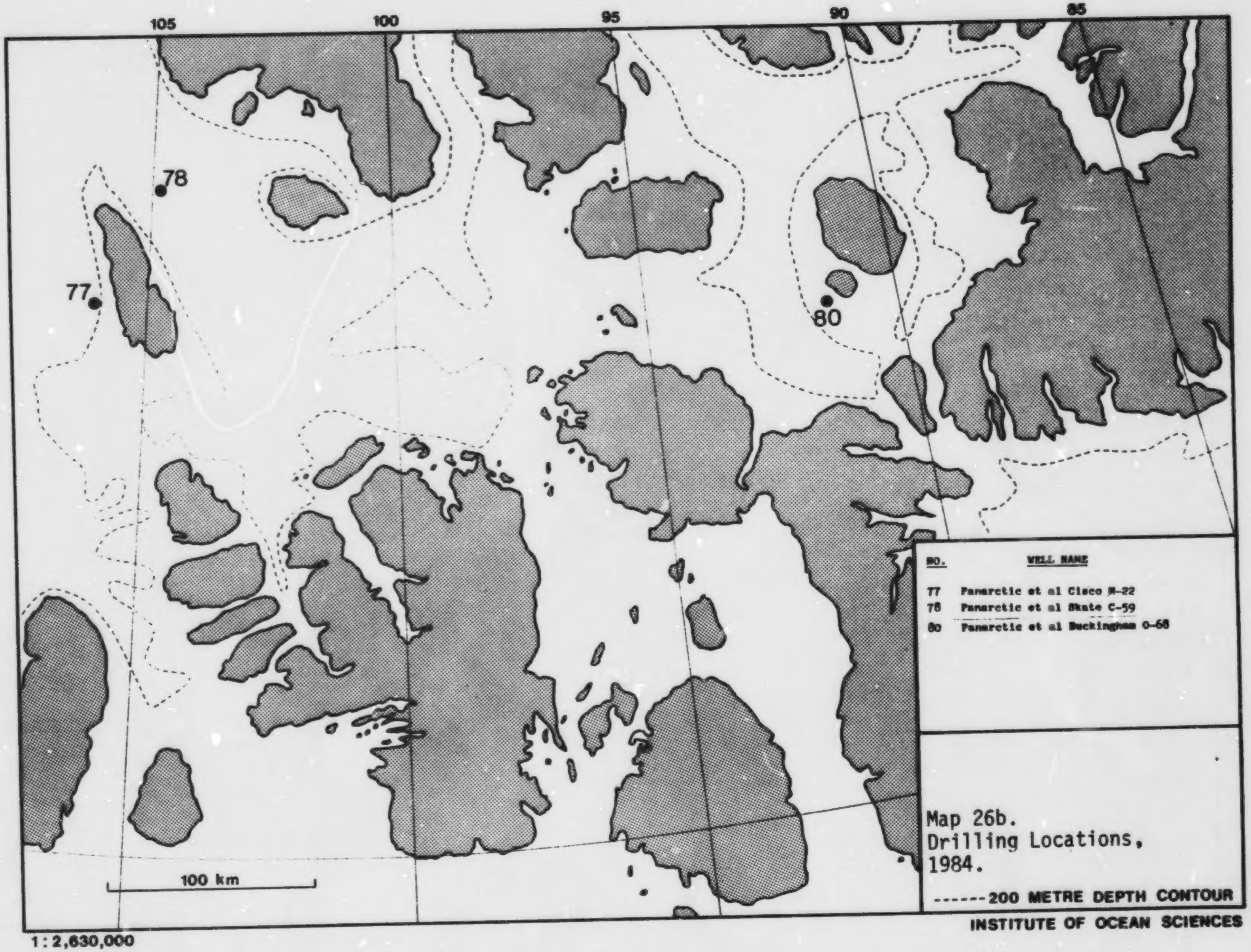

NO.	**WELL NAME**
77	Panarctic et al Cisco M-22
78	Panarctic et al Skate C-59
80	Panarctic et al Buckingham O-68

Map 26b.
Drilling Locations,
1984.

Cornwall, Cameron, Vesey Hamilton, King Christian and Melville islands. Table 6 outlines the drilling activities undertaken by all companies during this period.

5.5.4 Projected drilling activities

The principal areas of interest for exploration or delineation drilling in the next two years will be the Bent Horn oil field on Cameron Island and offshore regions adjacent to Lougheed Island (L. Franklin, pers. comm., 1985). Some drilling activity will be directed to further exploration of Maclean Strait northeast of Lougheed Island, while delineation wells may be drilled in the hopes of extending the Cisco and Skate fields off the west coast of the Island. Further delineation drilling can also be expected at Bent Horn, with the level of drilling activity perhaps increasing should the oil field come into production.

In general, approximately three-quarters of the wells drilled during the next two years will be located in offshore areas (L. Franklin, pers. comm., 1985). This projection was based on two factors. Firstly, the majority of unexplored area in the Sverdrup Basin lies in offshore areas, and this alone will result in the greater share of exploratory drilling being directed to offshore regions. Secondly, with the exception of gas discoveries on Sabine Peninsula, Melville Island and the oil field located at Bent Horn, Cameron Island, onshore drilling has yielded little in the way of hydrocarbon discoveries deserving further exploration. Conversely, offshore drilling in the vicinity of Lougheed Island and Sabine Peninsula has resulted in major hydrocarbon discoveries at the Whitefish, Cisco, Skate, Hecla and Drake fields with some promise of further discoveries in Maclean Strait. The primary focus of drilling activities in the near future will, therefore, centre on exploration in the vicinity of Maclean Strait and further delineation of existing offshore hydrocarbon fields. However, since the costs associated with onshore wells are significantly less than those for offshore wells, even relatively small onshore oil or gas discoveries may be viably comparable to larger offshore discoveries. Thus, while the majority of drilling activities will be directed to offshore areas, some exploratory drilling will continue on land masses in the Sverdrup Basin.

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8. APPENDICES:

Appendix A: Individual Seismic Survey Descriptions

(chronologically-ordered)

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Jan-30 May 1974

SURVEY VEHICLES: Six Foremost FN60 vehicles, 5 Foremost FN110 vehicles, 1 Foremost Yukon ATV, 1 each D-6 and D-7 Caterpiller tractors, portable camp mounted on 5 FN60 undercarriages

KILOMETRES SHOT: 340 KMS ONSHORE ONSHORE ACCESS ROUTES: 118 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B958

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Feb-31 May 1974

SURVEY VEHICLES: Seven Foremost FN60 vehicles, 2 Foremost FN110 vehicles, 1 Yukon Delta 3 ATV, 1 D-7 Caterpiller tractor, 1 977 series front-end loader

KILOMETRES SHOT: 265 KMS ONSHORE ONSHORE ACCESS ROUTES: 34 KMS

200 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B661

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Feb-31 May 1974

SURVEY VEHICLES: Six Foremost FN60 Vehicles, 2 RN110 tracked vehicles, 1 TN120 tracked vehicle, 2 Foremost FN110 vehicles, 1 each D-6 and D-7 Caterpiller tractors, portable facilities mounted on 6 TN90 undercarriages (south Bathurst Island); 15 Foremost FN110 vehicles, 1 each D-6 and D-7 Caterpiller tractors, 1 Delta 3 ATV (north Bathurst Island and Byam Martin Is.)

KILOMETRES SHOT: 770 KMS ONSHORE ONSHORE ACCESS ROUTES: 42 KMS

0 KMS OFFSHORE

MISCELLANEOUS: Two survey parties: South Bathurst Island and combined north Bathurst Island and Byam Martin Island

REFERENCES: DIAND Land Use Permit File N74B662

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 7 Mar-31 May 1974

SURVEY VEHICLES: Six Foremost FN60 vehicles, 2 Foremost FN110 vehicles, 1 TN120 tracked vehicle, 6 TN90 tracked vehicles, 1 each D-6 and D-7 Caterpiller tractors

KILOMETRES SHOT: 242 KMS ONSHORE   ONSHORE ACCESS ROUTES: 3 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B716

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 20 Mar-31 May 1974

SURVEY VEHICLES: Eleven Foremost FN60 vehicles, 5 Foremost FN110 vehicles, 2 Foremost FN160 vehicles, 1 Foremost Yukon ATV, 1 each D-6 and D-7 Caterpiller tractors,

KILOMETRES SHOT: 50 KMS ONSHORE   ONSHORE ACCESS ROUTES: 5 KMS

11 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B726

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 May-30 May 1974

SURVEY VEHICLES: Sixteen Playcat tracked vehicles

KILOMETRES SHOT: 0 KMS ONSHORE   ONSHORE ACCESS ROUTES: 0 KMS

454 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B681

SURVEY PROPONENT: Geological Survey of Canada

SURVEY PERIOD: 15 Mar-30 May 1974

SURVEY VEHICLES: Four skidoos, 205 and 206 helicopters used to transport personnel and equipment

KILOMETRES SHOT: 0 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

250 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B709

SURVEY PROPONENT: Imperial Oil Limited

SURVEY PERIOD: 10 May-5 June 1974

SURVEY VEHICLES: Two D-7 Caterpiller tractors, 3 terratire 200 vehicles, 5 Terratire 100 vehicles, portable facilities mounted on 3 Terratire chassis

KILOMETRES SHOT: 55 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

23 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B762

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Mar-5 June 1974

SURVEY VEHICLES: One each D-6 and D-7 Caterpiller tractors, 5 Foremost FN110 vehicles

KILOMETRES SHOT: 0 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

431 KMS OFFSHORE

MISCELLANEOUS: Airstrip located at 76° 57′ N, 109° 10′ W.

REFERENCES: DIAND Land Use Permit File N74B720

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Oct-15 Dec 1974

SURVEY VEHICLES: Eleven Foremost FN60 vehicles, 5 Foremost FN110 vehicles, 2 Foremost FN160 vehicles, 1 Foremost Yukon fuel unit, 1 each D-6 and D-7 Caterpiller tractors

KILOMETRES SHOT: 110 KMS ONSHORE ONSHORE ACCESS ROUTES: 4 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B866

SURVEY PROPONENT: Great Plains Oil and Gas Limited

SURVEY PERIOD: 1 Sept-31 Dec 1974

SURVEY VEHICLES: Seven Foremost FN110 vehicles, 4 D-7 Caterpiller tractors, 1 Rolligon 660 vehicle, 4 Rolligon 4460 vehicles, 3 Rolligon 4450 vehicles, 1 Rolligon 4600 vehicle, portable camp facilities mounted on 7 sleighs and 8 tracked undercarriages

KILOMETRES SHOT: 112 KMS ONSHORE ONSHORE ACCESS ROUTES: 51 KMS

0 KMS OFFSHORE

MISCELLANEOUS: Two Hercules strips, 1575 x 50m
Four DC3 strips, 955 x 30m

REFERENCES: DIAND Land Use Permit File N74B733

SURVEY PROPONENT: Elf Oil Exploration and Production Canada Limited

SURVEY PERIOD: 15 Sept-31 Dec 1974

SURVEY VEHICLES: Three D-7 and D-8 Caterpiller tractors, 16 Foremost FN 110 vehicles, 12 rubber-tired wagons, 6 sleds

KILOMETRES SHOT: 141 KMS ONSHORE ONSHORE ACCESS ROUTES: 83 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B834

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Oct-31 Dec 1974

SURVEY VEHICLES: Not given in source

KILOMETRES SHOT: 59 KMS ONSHORE ONSHORE ACCESS ROUTES: 31 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B890

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Oct-31 Dec 1974

SURVEY VEHICLES: Fifteen Foremost FN110 vehicles, 1 each D-6 and D-7 Caterpiller tractors, 1 Delta 3 vehicle

KILOMETRES SHOT: 219 KMS ONSHORE ONSHORE ACCESS ROUTES: 158 KMS

0 KMS OFFSHORE

MISCELLANEOUS: Main field base 76° 20' N, 98° 39' W.

REFERENCES: DIAND Land Use Permit File N74B861

SURVEY PROPONENT: N/A

SURVEY PERIOD: 1974

SURVEY VEHICLES: N/A

KILOMETRES SHOT: 100 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

0 KMS OFFSHORE

MISCELLANEOUS: DIAND Land Use Permit file unavailable at time of compilation

REFERENCES: DIAND Land Use Permit File N74B867

SURVEY PROPONENT: N/A

SURVEY PERIOD: 1974

SURVEY VEHICLES: N/A

KILOMETRES SHOT: 148 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

0 KMS OFFSHORE

MISCELLANEOUS: DIAND Land Use Permit file missing at time of compilation

REFERENCES: DIAND Land Use Permit File N74B960

SURVEY PROPONENT: N/A

SURVEY PERIOD: 1974

SURVEY VEHICLES: N/A

KILOMETRES SHOT: 148 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

0 KMS OFFSHORE

MISCELLANEOUS: DIAND Land Use Permit File missing at time of compilation

REFERENCES: DIAND Land Use Permit File N74B753

SURVEY PROPONENT: N/A

SURVEY PERIOD: 1974

SURVEY VEHICLES: N/A

KILOMETRES SHOT: 0 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

64 KMS OFFSHORE

MISCELLANEOUS: DIAND Land Use Permit File unavailable at time of compilation

REFERENCES: DIAND Land Use Permit File N74B678

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Jan-30 May 1975

SURVEY VEHICLES: Ten Foremost FN110 vehicles, 1 each D-6 and D-7 Caterpiller tractors, 1 Delta 3 ATV, portable camp mounted on 5 FN110 undercarriages

KILOMETRES SHOT: 159 KMS ONSHORE   ONSHORE ACCESS ROUTES: 122 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B961

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 28 Jan-30 June 1975

SURVEY VEHICLES: Six Foremost FN60 vehicles, 7 Foremost FN110 vehicles, 2 Foremost FN160 vehicles, 1 Foremost Yukon fuel unit, 1 each D-6 and D-7 Caterpiller tractors, portable camp moumted on 6 FN60 undercarriages

KILOMETRES SHOT: 475 KMS ONSHORE   ONSHORE ACCESS ROUTES: 382 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N75B187

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 May-30 June 1975

SURVEY VEHICLES: Ten Foremost FN110 vehicles, 1 Delta 3 ATV, 1 each D-6 and D-7 Caterpiller tractors, portable camp mounted on 5 FN110 undercarriages

KILOMETRES SHOT: 0 KMS ONSHORE   ONSHORE ACCESS ROUTES: 13 KMS

723 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N75B014

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 24 Oct-31 Dec 1975

SURVEY VEHICLES: Seven Foremost FN60, 4 Foremost FN110 vehicles

KILOMETRES SHOT: 18 KMS ONSHORE   ONSHORE ACCESS ROUTES: 0 KMS
0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N75B140

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Mar-30 May 1976

SURVEY VEHICLES: One Foremost FN110 vehicle, 1 each D-5 and D-7 Caterpiller tractors, 1 Bell 206 helicopter

KILOMETRES SHOT: 53 KMS ONSHORE   ONSHORE ACCESS ROUTES: 6 KMS
444 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N75B188

SURVEY PROPONENT: Sun Oil Company Limited

SURVEY PERIOD: 3 Mar-8 June 1976

SURVEY VEHICLES: Not given in source

KILOMETRES SHOT: 0 KMS ONSHORE   ONSHORE ACCESS ROUTES: 0 KMS
3464 KMS OFFSHORE

MISCELLANEOUS: Seven sub-surveys carried out in Massey Sound, Hassel Sound, Maclean Strait, Prince Gustaf Adolph Sea, Byam Martin Channel, Wilkins Strait, and Ballantyne Strait to measure sea ice thickness

REFERENCES:
Sun Oil Company Limited. "Statistical Study of Late Winter Ice Thickness Distribution in the Arctic Islands." Report prepared for Arctic Petroleum Operators Association (APOA), Report No. 117-1. 1977.

SURVEY PROPONENT: Mobil Oil Canada Limited

SURVEY PERIOD: 10 Mar-15 June 1976

SURVEY VEHICLES: Six Foremost FN60 vehicles, 7 Foremost FN110 vehicles, 1 Parkall vehicle, 2 D-7 Caterpiller tractors, 1 1500-gal. tracked fuel sloop, portable camp mounted on 5 FNT90 tracked undercarriages

KILOMETRES SHOT: 445 KMS ONSHORE   ONSHORE ACCESS ROUTES: 70 KMS
18 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N76B208

SURVEY PROPONENT: Mobil Oil Canada Limited

SURVEY PERIOD: 30 Aug-15 Sept 1976

SURVEY VEHICLES: Not used

KILOMETRES SHOT: 0 KMS ONSHORE   ONSHORE ACCESS ROUTES: 0 KMS
470 KMS OFFSHORE

MISCELLANEOUS: Airgun used as energy source

REFERENCES: DIAND Land Use Permit File N151-B6

SURVEY PROPONENT: Mobil Oil of Canada Limited

SURVEY PERIOD: 1 Feb-15 Mar 1977

SURVEY VEHICLES: Five Foremost FN60 vehicles, 7 Foremost FN110 vehiles, 5 Foremost FNT90 tracked trailers, 1 Parkall vehicles, 1 tracked explosives carrier, 1 977 and 2 D-7 Caterpiller tractors

KILOMETRES SHOT: 69 KMS ONSHORE   ONSHORE ACCESS ROUTES: 13 KMS
7 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N77B457

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 7 Feb-30 June 1977

SURVEY VEHICLES: Not given in source

KILOMETRES SHOT: 320 KMS ONSHORE   ONSHORE ACCESS ROUTES: 0 KMS
733 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N76B423

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 28 Jan-30 June 1977

SURVEY VEHICLES: Twelve Foremost FN110 vehicles, 1 each D-6 and D-7 Caterpiller tractors, portable camp mounted on 5 FN110 undercarriages

KILOMETRES SHOT: 374 KMS ONSHORE   ONSHORE ACCESS ROUTES: 104 KMS
85 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N77B189

SURVEY PROPONENT: Polar Gas Project

SURVEY PERIOD: 15 July-30 Sept 1977

SURVEY VEHICLES: Not used

KILOMETRES SHOT: 0 KMS ONSHORE   ONSHORE ACCESS ROUTES: 0 KMS
54 KMS OFFSHORE

MISCELLANEOUS: Airguns used as energy source; survey of proposed sites for Polar Gas pipeline crossings

REFERENCES: EPS Land Use Application File NW 1710

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 20 Sept-31 Dec 1977

SURVEY VEHICLES: Twelve Foremost FN110 vehicles, 1 each D-6 and D-7 Caterpiller tractors, portable camp mounted on 5 FN110 undercarriages

KILOMETRES SHOT: 229 KMS ONSHORE   ONSHORE ACCESS ROUTES: 42 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N77B107

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Oct-31 Dec 1977

SURVEY VEHICLES: Fifteen Foremost FN110 vehicles, 1 D-6 and 2 D-7 Caterpiller tractors, portable camp mounted on 5 FN110 undercarriages

KILOMETRES SHOT: 61 KMS ONSHORE   ONSHORE ACCESS ROUTES: 27 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N77B692

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Feb-31 Mar 1978

SURVEY VEHICLES: Two D-6 Caterpiller tracters, 1 Foremost FN10 and 3 FN20 vehicles, 3 Bombardier snowmobiles and 2 skidoos

KILOMETRES SHOT: 4 KMS ONSHORE   ONSHORE ACCESS ROUTES: 0 KMS

1074 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N78B763

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Feb-25 May 1978

SURVEY VEHICLES: Thirteen Foremost FN110 vehicles, 1 Foremost Yukon fuel unit, 1 each D-6 and D-7 Caterpiller tractors, portable camp mounted on 5 FN110 undercarriages

KILOMETRES SHOT: 83 KMS ONSHORE **ONSHORE ACCESS ROUTES:** 48 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N78B763

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Mar-31 May 1979

SURVEY VEHICLES: Seven Bombardier Muskeg carriers, 1 FN110 fuel carrier, 1 Bombardier 9-passenger snowmobile, 7 FNT90 tracked vehicles, 1 977 and 2 D-7 Caterpiller tractors (Noice Peninsula area); 15 Foremost FN110 vehicles, 2 D-7 Caterpiller tractors, 1 Foremost Yukon fuel unit, portable camp mounted on 7 FN110 undercarriages (Melville Island area)

KILOMETRES SHOT: 50 KMS ONSHORE **ONSHORE ACCESS ROUTES:** 325 KMS

925 KMS OFFSHORE

MISCELLANEOUS: Two sub-programs under one land use permit

REFERENCES: DIAND Land Use Permit File N79B987

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Mar-31 May 1980

SURVEY VEHICLES: Twelve Foremost FN110 vehicles, 1 977 and 3 D-7 Caterpiller tractors, portable camp mounted on 10 FN110 undercarriages

KILOMETRES SHOT: 0 KMS ONSHORE **ONSHORE ACCESS ROUTES:** 135 KMS

643 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N80B213

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Sept-30 Dec 1980

SURVEY VEHICLES: Fifteen Foremost FN110 vehicles

KILOMETRES SHOT: 170 KMS ONSHORE   ONSHORE ACCESS ROUTES: 0 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N80B351

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Mar-1 May 1981

SURVEY VEHICLES: Not given in source

KILOMETRES SHOT: 8 KMS ONSHORE   ONSHORE ACCESS ROUTES: 0 KMS

862 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N81B645

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 7 Sept-31 Dec 1981

SURVEY VEHICLES: Ten Foremost FN110 vehicles

KILOMETRES SHOT: 507 KMS ONSHORE   ONSHORE ACCESS ROUTES: 4 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N81B584

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1981 (Survey period not available)

SURVEY VEHICLES: N/A

KILOMETRES SHOT: 0 KMS ONSHORE   ONSHORE ACCESS ROUTES: 13 KMS
556 KMS OFFSHORE

MISCELLANEOUS: DIAND Land Use Permit file not available at time of compilation

REFERENCES: DIAND Land Use Permit File N81B438

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Mar-31 May 1982

SURVEY VEHICLES: Five DMC 1450 vehicles, 5 DMC 1200 vehicles, 1 Foremost FN110 vehicle, 2 Foremost FN60 vehicles, 1 977 and 3 D-7 Caterpiller tractors, portable camp mounted on sleighs

KILOMETRES SHOT: 60 KMS ONSHORE   ONSHORE ACCESS ROUTES: 66 KMS
830 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: EPS Land Use Application File NW 9436

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Mar-31 May 1982

SURVEY VEHICLES: Four DMC 1450 and 5 DMC 1200 vehicles, 3 Foremost FN110 vehicles, 1 977 and 3 D-7 Caterpiller tractors portable camp mounted on 2 FN160 undercarriages and 7 sleighs (Maclean Strait); 12 FN110 tracked vehicles, 1 977 and 3 D-7 Caterpiller tractors, 1 Bombardier snowmobile, portable camp mounted on 8 FN110 undercarriages (Prince Gustaf Adolph Sea); 12 FN110 vehicles, 1 977 and 3 D-7 Caterpiller tractors, 1 Bombardier 252G Skidozer, portable camp mounted on 15 FN110 undercarriages (Hazen and Ballantyne Straits)

KILOMETRES SHOT: 53 KMS ONSHORE   ONSHORE ACCESS ROUTES: 86 KMS
3065 KMS OFFSHORE

MISCELLANEOUS: Three sub-programs carried out under one permit

REFERENCES: DIAND Land Use Permit File N81B645

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Mar-21 May 1983

SURVEY VEHICLES: Twelve Foremost FN110 vehicles, 1 977 and 3 D-7 Caterpiller tractors, 1 Bombardier 252G Skidozer, portable camp mounted on 12 FN110 undercarriages

KILOMETRES SHOT: 191 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

8 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N83B911

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Mar-24 May 1983

SURVEY VEHICLES: Twelve Foremost FN110 vehicles, 1 977 and 3 D-7 Caterpiller tractors, 1 Bombardier 252G Skidozer, portable camp mounted on 9 FN110 undercarriages

KILOMETRES SHOT: 55 KMS ONSHORE ONSHORE ACCESS ROUTES: 29 KMS

1505 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N83B848

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 13 Sept-19 Dec 1983

SURVEY VEHICLES: Fourteen Foremost FN110 vehicles, 1 977 and 3 D-7 Caterpiller tractors, 2 Bombardier 252G Skidozers, portable camp mounted on 13 FN110 undercarriages

KILOMETRES SHOT: 323 KMS ONSHORE ONSHORE ACCESS ROUTES: 35 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N83B964

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Mar-10 May 1984

SURVEY VEHICLES: Seven DMC 1200 and 4 DMC 1450 vehicles, 3 Foremost FN110 and 2 FN60 vehicles, 1 977 and 3 D-7 Caterpiller tractors, portable camp mounted on 2 FN160 tracked undercarriages and 10 sleighs.

KILOMETRES SHOT: 80 KMS ONSHORE   ONSHORE ACCESS ROUTES: 0 KMS

439 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N83B055

Appendix B: Common Drilling Fluid Components and Additives by Tradename

Appendix B. Common Drilling Fluid Components and Additives by Tradename. (Source: Neff, 1982)

MILCHEM	BAROID	MAGCOBAR	IMCO	DESCRIPTION
Weight Materials and Viscosifiers				
Flosal	Flosal	Visquick	IMCO Shurlift	Asbestos Fibers
Galena	Galena	Super-Wate	Galena	Pulverized Lead Ore
Green Band	Baroco	High Yield	IMCO Klay	Sub Bentonite
Mil-Bar	Baroid	Magcobar	IMCO Bar	Barite
Milgel	Aquagel	Magcogel	IMCO Gel	Bentonite Clay
Mil-Polymer 302				Polysaccharide Polymer
Salt Water Gel	Zeogel	Salt Gel	IMCO Brinegel	Attapulgite Clay
Super-Col	Quik-Gel	Kwik-Thik	IMCQ HYB	Extended Bentonite
W.O. 30		Lo Wate	IMCO Wate	Calcium Carbonate
XC Polymer	XC Polymer	Duovis	XC Polymer	Xanthum Gum Polymer
Deflocculants-Thinner				
Chemtrol 3 CLS				Chrome Lignosulfonate
Desco	Desco	Desco	Desco	Organic Mud Thinner
Mil Flo				Polyflavinoid Compound
Mil Quebracho	Tannex	MC Quebracho	IMCO QBT	Quebracho-Lignite Blend
Ohfos	Barafos	Magco-Phos	IMCO Phos	Sodium Tetraphosphate
Rayflo	Rayflo	Rayflo	Rayflo	Hemlock Extract
SAPP	SAPP	SAPP	SAPP	Sodium Acid Pyrophosphate
Uni-Cal	Q-Broxin	Spersene	IMCO VC-10	Chrome Lignosulfonate
Filtration Control Materials				
Chemtrol-X		Resinex	IMCO Poly Rx	Polymer Blend
Cypan	Cypan	Cypan	Cypan	Sodium Polyacrylate
Drispac	Drispac	Drispac	Drispac	Polyanionic Cellulose Polymer
Drispac Lo-Vis	Drispac LV		Drispac Super-Lo	Polyanionic Cellulose Polymer Low Viscosity
Ligco	Carbonox	Tann-A-Thin	IMCO Lig	Mined Lignite
Ligcon	CC-16	Caustalig	IMCO Thin	Causticized Lignite
Lo Loss	Lo Loss	Lo Loss	Lo Loss	Chem Treated Guar Gum
Milchem CMC-Med	Cellex-Reg	Magco CMC-Reg	IMCO CMC-Reg	Carboxymethylcellulose
Milchem CMC-HV	Cellex-HV	Magco CMC-HV	IMCO CMC-HV	Carboxymethylcellulose
Mil Con		XP-20		Heavy Metal Modified Lignite
Milstarch	Impermex	My-Lo-Jel	IMCO Loid	Pregelatinized Starch
Preservative	Aldacide	My-Lo-Jel Preservative	Preservaloid	Paraformaldehyde
Perma-Lose				Non-Fermenting Organic Polymer
Starlose	Dextrid	Pemstarch	IMCO Permaloid	Non-Fermenting Organic Polymer
SPA	SPA	SPA	SPA	Sodium Polyacrylate
WL-100	WL-100	WL-100	WL-100	Sodium Polyacrylate
Loss of Circulation Additives				
Diaseal M	Diaseal M	Diaseal M	Diaseal M	Mixture of Filter Aid Materials
Kwik-Seal	Kwik-Seal	Kwik-Seal	Kwik-Seal	Combination of Granules, Flakes and Fibers
Mil-Cedar Plug	Plug-Git	Chip-Seal		Shredded Cedar Fibers
Mil-Fiber	Fibertex	Mud Fiber	IMCO Fyber	Processed Cane Fibers
Milflake	Jelflake	Cell-O-Seal	IMCO Flakes	Shredded Cellophane Flakes
Milmica	Micatex	Magco Mica	IMCO Myca	Flake Mica
Mil-Plug	Wall-Nut	Nut Plug	IMCO Plug	Ground Nut Hulls
Specialty Additives				
Alum Stearate	Alum Stearate	Alum Stearate	Alum Stearate	Aluminum Stearate Defoamer
Ami-TEC	Coat 415	Magco Inhibitor 202	IMCO PT-102	Oil Soluble, Water Dispersible Amine Corrosion Inhibitor
Ampli-Foam	Quik-Foam	Magco Foamer 66		Gen Purpose Foaming Agent for Brackish or Salt Water
Aquanul 803	Surflo B11			Anionic Microbiocide
Aquatec	Coat 122	Magco Inhibitor 101		Amine Corrosion Inhibitor for Water, Air-Mist Drilling
Atlosol	Trimulso	Magconate		Anionic Non-Ionic Emulsifier

Appendix B. Common Drilling Fluid Components and Additives by Tradename. continued

MILCHEM	BAROID	MAGCOBAR	IMCO	DESCRIPTION
Specialty Additives (continued)				
Atlosol-S	Seamul	Salinex	IMCO SWS	Salt Water Emulsifier
Ben-Ex	Ben-Ex	Ben-Ex	Ben-Ex	Copolymer, Flocculant and Clay Extender
C-88				Oxalic Acid
Caltrol	Shale-Ban	T-8	IMCO SCR	Shale Control Reagent
DME		Surfak E	DME	Non-Ionic Emulsifier
DMS	Aktoflo S	Surfak M	DMS	Non-Ionic Surfactant
Drillaid 405	Drillaid 405	Drillaid 405	Drillaid 405	Non-Fluorescent Lubricant
Gel-Air				Gen Purpose Foaming Agent for Fresh Water-Stiff Foam
IPI (W.D.)	Baroid Asphalt	Stabil-Hole	IMCO Holecoat	Powdered, Water Dispersible Asphalt
LD-8		Magconol	IMCO Foamban	Non-Hydrocarbon Defoamer
Lo-Sol	X-Tend	Rapidrill	IMCO Gelex	Liquid Bentonite Extender
Lubri-Film	E P Mudlube	Bit Lube	IMCO E P Lube	Extreme Pressure Lubricant
Lubri-Sal				Biodegradable Bore Hold Lubricant for Brackish Water
Mil-Clean				Biodegradable Detergent
Milchem MD	Condet	DD	IMCO MD	Mud Detergent
Mil-Emulsifier				Oil Soluble Emulsifier
Mil-Free	Skot Free	Pipe Lax	IMCO Freepipe	Surfactant to be Mixed with Diesel to Free Stuck Pipe
Mil-Gard	Coat 45		IMCO Sulf-X	Sulfide Scavenger
Mil-Graphite	Graphite	Flake Graphite	Graphite	Graphite
Mil-Plate	Torq-Trim	DOS-3	Lubrikleen	Biodegradable Bore Hole Lubricant for Fresh Water
Mil-Temp				High Temp Stabilizer for Water Base Mud
Moxygen	Coat 888	OS-1		Oxygen Scavenger
Moxygen L	Coat 777	OS-1L	IMCOX-O2	OXygen Scavenger-Liquid
Scale-Ban	SURFLO H35	SI 1000		Scale inhibitor
Select Floc	Drillaid 421	Floxit		Drilled Solids Flocculant
Separan	Separan	Separan	Separan	Clay Flocculant
Super Shale-Trol 202				Additive for Gumbo Shale Drilling
Soltex	Soltex	Soltex	Soltex	Sulfonated Residuum
XKB-Lig	K-Lig		IMCO Inpac	Potassium Lignite
XKB-Thin	K-Flo		IMCO Inpac	Iron-Complexed Lignosulfate
Oil Base Mud Additives				
CARBO-FREE	E Z Spot		IMCO Spot	Variable Density Oil Phase Spotting Fluid Conc for Oil Mud
CARBO-GEL	Geltone	VG-69	IMCO Ken Gel	Organophilic Colloid
CARBO-MIX	Invermul	Vertoil	IMCO Ken X	Basic Oil Mud Emulsifier
CARBO-MUL	E Z Mul	SE-11		Quick Emulsification & Rapid Oil Wetting of Solids
CARBO-SEAL		Oil Seal		Granular Hydrocarbon
CARBO-TEC			IMCO Ken X-3	Emulsifier for High Temp Systems
CARBO-TROL	Duratone	DV-22	IMCO Ken X-2	Filtration Control at High Temp
SURF-COTE	OMC	DV-33	IMCO Ken-Thin	Oil Wetting Agent
Workover Additives				
W. O. ^{TM}20	Workover One	Polybrine	IMCO Safe-Vis	Polymeric Viscosifier & Fluid Loss Control Agent
W. O. ^{TM}21			IMCO Safe-Visx	High Yielding Polymeric Viscosifier
W. O. ^{TM}30		Mixical	Safe-Seal	Graded Calcium Carbonate
W. O. ^{TM}50		Ceastop	Safe-Perfseal	One Package Additive for Preparing Viscous Pill
W. O. ^{TM}60				Acid-Soluble Polymeric Viscosifier
W. O. ^{TM}DEFOAM		Magconol	Foamban	Alcohol Base Defoamer

Chemicals (Commercial Chemicals Widely Used in Drilling Muds)

Bicarbonate of Soda
Calcium Chloride
Caustic Soda
Chrome Alum
Chromic Chloride

Dowcide G
Gypsum
Lime
Salt

Potassium Chloride
Soda Ash
Sodium Bichromate
Sodium Chromate

Appendix C: Individual Well Descriptions

(ordered by year and cross-referenced by unique numbers)

INDEX NUMBERS AND WELL SUMMARIES

NO.	WELL NAME	WELL DEPTH	STATUS	RIG RELEASE DATE
01	Dome Panarctic Texex Weatherall O-10	2,287 m	abandoned	19 Jan. 1974
02	Panarctic Home et al Sirius K-28	2,871 m	abandoned	26 Feb. 1974
03	Panarctic et al Drake Point D-68	5,416 m	gas well	25 Mar. 1974
04	Imperial Panarctic et al Sherwood F-37	3,136 m	abandoned	05 Apr. 1974
05	Panarctic Tenn et al Bent Horn N-72	4,384 m	oil discovery	05 Apr. 1974
06	Panarctic Tenn et al W. Hecla N-52	939 m	gas well	15 Apr. 1974
07	Sun et al Elve M-40	1,875 m	abandoned	19 May 1974
08	Panarctic Tenn et al Homestead Drake E-78	1,357 m	gas well	27 May 1974
09	Panarctic Gulf Eglinton P-24	1,838 m	abandoned	03 July 1974
10	Panarctic Homestead POR N. Sabine H-49	3,810 m	abandoned	08 July 1974
11	Panarctic Tenn Robert Harbour K-07	3,805 m	abandoned	17 Aug. 1974
12	Panarctic Dome et al Sherard Bay F-14	1,343 m	abandoned	31 Oct. 1974
13	Panarctic et al Pedder Point D-49	1,875 m	abandoned	10 Nov. 1974
14	Dome Arctic Ventures Crocker I-53	3,584 m	abandoned	05 Dec. 1974
15	Panarctic Cape Fleetwood M-21	3,514 m	abandoned	07 Dec. 1974
16	Panarctic Collingwood K-33	2,046 m	abandoned	18 Feb. 1975
17	Panarctic et al W. Bent Horn C-44	3,563 m	abandoned	06 Apr. 1975
18	Panarctic Gulf et al East Drake I-55	1,189 m	gas discovery	16 Apr. 1975
19	Panarctic et al Pat Bay A-72	3,230 m	abandoned	06 May 1975
20	Panarctic Tenn et al Drake D-73	1,361 m	gas well	10 May 1975
21	Elfex et al Wilkie Point J-51	2,347 m	abandoned	21 May 1975
22	Panarctic et al Chads Creek B-64	5,036 m	abandoned	27 June 1975
23	Panarctic Mocklin Point D-23	2,802 m	abandoned	20 July 1975
24	Panarctic Bent Horn F-72	3,216 m	abandoned	24 Aug. 1975

INDEX NUMBERS AND WELL SUMMARIES
continued

NO.	WELL NAME	WELL DEPTH	STATUS	RIG RELEASE DATE
25	Panarctic et al E. Hecla C-32	1,341 m	gas well	10 Dec. 1975
26	Texex King Point West B-53	2,137 m	abandoned	02 Jan. 1976
27	Elf et al Dyer Bay L-49	3,171 m	abandoned	20 Feb. 1976
28	Panarctic et al Sabine Bay A-07	5,193 m	abandoned	24 Feb. 1976
29	Panarctic W. Hecla P-62	1,128 m	gas discovery	26 Feb. 1976
30	Panarctic et al Jackson Bay G-16	1,201 m	abandoned	15 Mar. 1976
31	Panarctic Tenn CS N.W. Hecla M-25	1,207 m	gas well	18 Apr. 1976
32	Panarctic W. Bent Horn E-43	3,371 m	abandoned	19 Apr. 1976
33	Panarctic et al Jackson Bay G-16A	1,600 m	gas discovery	30 Apr. 1976
34	Panarctic Tenn et al W. Hecla C-05	1,237 m	abandoned	16 May 1976
35	Panarctic et al West Bent Horn A-02	3,361 m	oil discovery	01 Aug. 1976
36	Panarctic et al Key Point O-51	3,482 m	abandoned	06 Sept. 1976
37	Panarctic Charles Point G-07	3,864 m	abandoned	07 Feb. 1977
38	Panarctic N.E. Drake P-40	1,295 m	abandoned	12 Mar. 1977
39	Panarctic S.W. Hecla C-58	1,219 m	gas well	29 Apr. 1977
40	Panarctic et al West Bent Horn I-01A	3,280 m	abandoned	18 May 1977
41	Panarctic West Bent Horn M-12	3,231 m	abandoned	03 June 1977
42	Panarctic AIEG et al Depot Island C-44	2,669 m	abandoned	10 June 1977
43	Panarctic Sophie Point G-19	3,792 m	abandoned	30 Sept. 1977
44	Panarctic et al Richardson Point G-12	3,356 m	abandoned	25 Jan. 1978
45	HB Norcen Phillips Cape Allison L-50	2,122 m	abandoned	04 Mar. 1978
46	Panarctic et al AIEG Roche Point J-43	2,882 m	gas discovery	18 Apr. 1978
47	Panarctic Norcen **AIEG** et al Grassy 1-34	975 m	abandoned	22 Apr. 1978
48	Panarctic Drake F-76	1,128 m	gas well	28 Apr. 1978
49	Panarctic et al Beverly Inlet G-13	4,061 m	abandoned	23 June 1978

INDEX NUMBERS AND WELL SUMMARIES
continued

NO.	WELL NAME	WELL DEPTH	STATUS	RIG RELEASE DATE
50	Panarctic et al Drake Point K-79	1,725 m	abandoned	23 June 1978
51	Panarctic et al Bent Horn A-57	3,627 m	abandoned	29 Aug. 1978
52	Panarctic et al Stokes Range J-11	3,340 m	abandoned	17 Sept. 1978
53	Panarctic et al Noice D-41	2,347 m	abandoned	02 Jan. 1979
54	Dome Panarctic et al Hoodoo E-05	2,476 m	abandoned	03 Jan. 1979
55	Panarctic AIEG et al Desbarats B-73	1,085 m	abandoned	27 Mar. 1979
56	Phillips et al Hazen Strait F-54	3,064 m	abandoned	12 May 1979
57	Panarctic AIEG Whitefish H-63	2,126 m	gas discovery	17 May 1979
58	Mobil Cornwall O-30	3,584 m	abandoned	14 Oct. 1979
59	Panarctic AIEG Dome PPC Char G-07	2,179 m	oil and gas discovery	22 Apr. 1980
60	Panarctic AIEG PPC Balaena D-58	1,874 m	oil trace	27 Apr. 1980
61	Panarctic AIEG Whitefish 2H-63	3,003 m	gas well	15 May 1980
62	Dome Wallis H-73	2,827 m	abandoned	23 Aug. 1980
63	Panarctic AIEG Vesey A-27	2,922 m	abandoned	09 Sept. 1980
64	Panarctic AIEG PPC Dome Skate B-80	1,655 m	oil and gas discovery	04 Apr. 1981
65	Panarctic AIEG Phillips Cisco B-66	2,412 m	oil and gas discovery	04 May 1981
66	Panarctic AIEG PPC Dome Maclean I-72	2,475 m	oil and gas discovery	04 May 1981
67	Panarctic W. Bent Horn G-02	3,220 m	abandoned	04 Sept. 1981
68	Panarctic Dome et al Hoodoo N-52	1,650 m	abandoned	11 Nov. 1981
69	Panarctic et al Cisco C-42	1,750 m	oil well	20 Apr. 1982
70	Panarctic et al Cape Mamen F-24	2,925 m	abandoned	28 Apr. 1982
71	Panarctic et al Whitefish A-26	2,817 m	abandoned	30 Apr. 1982

INDEX NUMBERS AND WELL SUMMARIES
continued

NO.	WELL NAME	WELL DEPTH	STATUS	RIG RELEASE DATE
72	Panarctic et al Sculpin K-08	1,850 m	gas discovery	03 May 1982
73	Panarctic et al Cisco K-58	2,240 m	oil well	01 Feb. 1983
74	Panarctic et al Cape Macmillan 2K-15	2,090 m	oil and gas discovery	12 Apr. 1983
75	Panarctic et al Grenadier A-26	2,766 m	abandoned	17 Apr. 1983
76	Panarctic et al Maryatt Point K-71	5,300 m	abandoned	17 July 1983
77	Panarctic et al Cisco M-22	2,367 m	abandoned	12 Apr. 1984
78	Panarctic et al Skate C-59	2,300 m	gas well	13 Apr. 1984
79	Panarctic et al Sherard Bay F-34	5,437 m	abandoned	01 May 1984
80	Panarctic et al Buckingham 0-68	2,772 m	abandoned	14 May 1984

WELL NAME: Dome Panarctic Texex Weatherall O-10 01

LATITUDE: 75° 49′ 51′ LONGITUDE: 108° 31′ 50′ STATUS: Abandoned

SPUD DATE: 6 Dec 1973 RIG RELEASE DATE: 19 Jan 1974 WELL DEPTH: 2287m

DRILL CAMP DIMENSIONS: 330 x 165m DRILLING WASTE SUMP DIMENSIONS: Not given

AIRSTRIP DIMENSIONS: Herc strip 1525 x 60m ACCESS ROADS: Not given in source

WELL SITE VEHICLES: Two D-7 Caterpiller tractors, two 30-ton oilfield trucks, one forklift, one .5-ton truck

MUD COMPONENTS:

Caustic soda	2091 kg	Aluminum stearite	24 kg
Drilaid	196 kg	Barite	59364 kg
Sodium bicarbonate	1773 kg	C.M.C.	1273 kg
Gel	43273 kg	Calcium chloride	1818 kg
Soda ash	1727 kg	Spersene	1136 kg
Q-Broxin	2136 kg	Walnut hulls	909 kg

MISCELLANEOUS:

REFERENCES: COGLA Well History Microfiche D.A. 733

DIAND Land Use Permit N73A540

WELL NAME: Panarctic Home et al Sirius K-28 02

LATITUDE: 79° 18′ 35″ LONGITUDE: 103° 41′ 43″ STATUS: Abandoned

SPUD DATE: 26 Nov 1973 RIG RELEASE DATE: 26 Feb 1974 WELL DEPTH: 2871m

DRILL CAMP DIMENSIONS: 120 x 60m DRILLING WASTE SUMP DIMENSIONS: 30 x 20 x 2m

AIRSTRIP DIMENSIONS: Herc strip 1525 x 60m ACCESS ROADS: 42.4 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, three 30-ton oilfield trucks, two forklifts, two .5-ton tricks, one snowmobile.

MUD COMPONENTS:

Barite	191591 kg	Palcoseal	45 kg
Bentonite	39318 kg	Kwik Seal	73 kg
Caustic soda	4228 kg	Walnut hulls	727 kg
Chrome alum	1037 kg	Wood fibers	227 kg
XC-Polymer	4841 kg	Sawdust	3636 kg
Sodium bicarbonate	1318 kg	Visbestos	958 kg
Dowicide B	164 kg	C.M.C.	96 kg
Fine mica	2727 kg	Soda ash	21 kg
Peltex	2182 kg	Chevron Foam	5 bbls

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 730

DIAND Land Use Permit N73A559

WELL NAME: Panarctic et al Drake Point D-68 03

LATITUDE: 76° 27′ 05″ **LONGITUDE:** 108° 55′ 42″ **STATUS:** Gas Well

SPUD DATE: 7 June 1973 **RIG RELEASE DATE:** 25 Mar 1974 **WELL DEPTH:** 5416m

DRILL CAMP DIMENSIONS: 330 x 330m **DRILLING WASTE SUMP DIMENSIONS:** Not given in source

AIRSTRIP DIMENSIONS: Twin Otter strip 457 x 30m **ACCESS ROADS:** 14.4 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, two Kenworth oilfield trucks, two forklifts, one .5-ton truck, one Bombardier snowmobile

MUD COMPONENTS:

Bentonite	189863 kg	Gel	91 kg
Caustic soda	19954 kg	Soda ash	3954 kg
XC-Polymer	25909 kg	Mica	3865 kg
Barite	2009227 kg	Alcohol	197 l
Chromic chloride	129 kg	Sodium chromate	5295 kg
Chrome alum	1147 kg	Sodium bichromate	3454 kg
Sodium bicarbonate	5727 kg	S.A.P.P.	318 kg
Sawdust	23172 kg	Flo-sal	522 kg
Plaster	136 kg	Walnut hulls	340 kg
Kwik Seal	2322 kg	Lignite	454 kg
Cello flakes	254 kg	Pipelax	1.5 bbls
Aluminum Stearate	116 kg	Diesel oil	.45 bbls
Peltex	14681 kg	CMC	136 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 702

DIAND Land Use Permit N73A422

WELL NAME: Imperial Panarctic et al Sherwood P-37 04

LATITUDE: 78° 16′ 47″ **LONGITUDE:** 89° 45′ 26″ **STATUS:** Abandoned

SPUD DATE: 9 Dec 1973 **RIG RELEASE DATE:** 5 Apr 1974 **WELL DEPTH:** 3136m

DRILL CAMP DIMENSIONS: **DRILLING WASTE SUMP DIMENSIONS:** 60 x 45 x 4m and 18 x 55 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m
T. Otter strip 457 x 30m **ACCESS ROADS:** Not given in source

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Gel	191454 kg
Sodium bicarbonate	3045 kg
Caustic soda	4772 kg
Barite	85409 kg
Sawdust	4636 kg
XC-Polymer	

MISCELLANEOUS: Dock and storage area at 78° 13′ N, 89° 44′ W.

REFERENCES: COGLA. Well History Microfiche D.A. 727

DIAND Land Use Permit N73A477

WELL NAME: Panarctic Tenn et al Bent Horn N-72 05

LATITUDE: 76° 21′ 50″ LONGITUDE: 103° 58′ 11″ STATUS: Oil Discovery

SPUD DATE: 24 Nov 1973 RIG RELEASE DATE: 5 Apr 1974 WELL DEPTH: 4384m

DRILL CAMP DIMENSIONS: 305 x 60m DRILLING WASTE SUMP DIMENSIONS: 41 x 30 x 3m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 4 km

WELL SITE VEHICLES: Two D-6 Caterpiller tractors, two 30-ton oilfield trucks, two forklifts, one Foremost Delta 3 vehicle, one .5-ton truck

MUD COMPONENTS: Not given in source

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit N73A500

WELL NAME: Panarctic Tenn et al W. Hecla N-52 06

LATITUDE: 76° 21′ 53″ LONGITUDE: 110° 50′ 52″ STATUS: Gas Well

SPUD DATE: 5 Mar 1974 RIG RELEASE DATE: 15 Apr 1974 WELL DEPTH: 939m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Herc ice strip, 1530 x 60m ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Barite	72863 kg
Bentonite	11954 kg
Gel	6909 kg
Attapulgite	1545 kg
XC-Polymer	786 kg
Peltex	409 kg
Caustic soda	151 kg
Sodium bicarbonate	500 kg
CMC	68 kg
Chrome Alum	31 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 738

07

WELL NAME: Sun et al Elve M-40

LATITUDE: 78° 09' 58" LONGITUDE: 101° 49' 40" STATUS: Abandoned

SPUD DATE: 21 Mar 1974 RIG RELEASE DATE: 19 May 1974 WELL DEPTH: 1875m

DRILL CAMP DIMENSIONS: 305 x 153m DRILLING WASTE SUMP DIMENSIONS: 30 x 30 x 2m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 30 km

WELL SITE VEHICLES: One each D-4, D-6 and D-7 Caterpiller tractors, three 30-ton oilfield trucks, two .5-ton trucks, two Otaco sleighs, one forklift, one grader, one Foremost Husky ATV, one Bombardier snowmobile

MUD COMPONENTS:

XC-Polymer	2090 kg
Bentonite	272 kg
Chrome alum	415 kg
Caustic soda	315 kg
Sodium bicarbonate	545 kg
Barite	8545 kg
Calcium chloride	31 kg
Lime	193 kg
Sawdust	1854 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 750

DIAND Land Use Permit n74A707

08

WELL NAME: Panarctic Tenn et al Homestead Drake E-78

LATITUDE: 76° 27' 19" LONGITUDE: 108° 29' 25" STATUS: Gas Well

SPUD DATE: 2 May 1974 RIG RELEASE DATE: 27 May 1974 WELL DEPTH: 1357m

DRILL CAMP DIMENSIONS: 213 x 123m DRILLING WASTE SUMP DIMENSIONS: Not given in source

AIRSTRIP DIMENSIONS: None ACCESS ROADS: Not given in source

WELL SITE VEHICLES: One each D-6 and D-8 Caterpiller tractors, three 30-ton oilfield trucks, two forklifts, one 5-ton Foremost Yukon ATV, one grader, on .5-ton truck

MUD COMPONENTS: Not given in source

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit N73A399

09

WELL NAME: Panarctic Gulf Eglinton P-24

LATITUDE: 75° 53' 52" LONGITUDE: 118° 07' 39" STATUS: Abandoned

SPUD DATE: 6 June 1974 RIG RELEASE DATE: 3 July 1974 WELL DEPTH: 1838m

DRILL CAMP DIMENSIONS: 120 x 130m DRILLING WASTE SUMP DIMENSIONS: 30 x 20 x 3

AIRSTRIP DIMENSIONS: T. Otter strip 450 x 30m ACCESS ROADS: 10.8 km

WELL SITE VEHICLES: One each D-6 and D-8 Caterpiller tractors, three 30-ton oilfield trucks, two forklifts, one 5-ton Foremost Yukon ATV, one grader, on .5-ton truck

MUD COMPONENTS:

Caustic soda	2111 kg
XC-Polymer	2045 kg
Chrome alum	413 kg
Barite	7227 kg
Gel	5954 kg
Sodium bicarbonate	91 kg
Sawdust	313 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 766

DIAND Land Use Microfiche N74A771

10

WELL NAME: Panarctic Homestead POR N. Sabine H-49

LATITUDE: 76° 49' 18" LONGITUDE: 108° 39' 27" STATUS: Abandoned

SPUD DATE: 3 May 1974 RIG RELEASE DATE: 8 July 1974 WELL DEPTH: 3810m

DRILL CAMP DIMENSIONS: 330 x 220m DRILLING WASTE SUMP DIMENSIONS: 33 x 33 x 3m

AIRSTRIP DIMENSIONS: Herc strip 1525 x 60m ACCESS ROADS: 43.4 km

WELL SITE VEHICLES: One each D-7 and D-8 Caterpiller tractors, two Kenworth oilfield trucks, two forklifts, one Bombardier snowmobile, one .5-ton truck

MUD COMPONENTS:

Bentonite	37227 kg	Sodium bicarbonate	409 kg
XC-Polymer	5613 kg	Sawdust	20600 kg
Chrome alum	909 kg	Lime	50 kg
Barite	38409 kg	Peltex	159 kg
Detergent	3 bbls	Soda ash	91 kg
Calgon	45 kg	Visbestos	772 kg
Caustic soda	3806 kg	Sodium bichromate	1227 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 758

DIAND Land Use Permit N73A541

WELL NAME: Panarctic Tenn Robert Harbour K-07 11

LATITUDE: 76° 36' 32" LONGITUDE: 104° 02' 14" STATUS: Abandoned

SPUD DATE: 26 Apr 1974 RIG RELEASE DATE: 17 Aug 1974 WELL DEPTH: 3805 m

DRILL CAMP DIMENSIONS: 180 x 150m DRILLING WASTE SUMP DIMENSIONS: 41 x 33 x 3m

AIRSTRIP DIMENSIONS: Herc strip 1525 x 60m ACCESS ROADS: 32 km

WELL SITE VEHICLES: One D-6 Caterpiller tractor, two 30-ton oilfield trucks, one .5-ton truck, two forklifts, one Foremost Delta 3 ATV

MUD COMPONENTS:

Aluminum stearate	129 kg	Lime	386 kg
Barite	225227 kg	Magobar	94 l
Bentonite	59090 kg	Plaster	1409 kg
Sodium bicarbonate	272 kg	Peltex	750 kg
Caustic soda	875 kg	Gel	5863 kg
Chrome alum	2077 kg	Sparto Ep	3 bbls
CMC	272 kg	Diesel oil	88 bbls
Dowicide B	161 kg	Crude oil	34 bbls
Gypsum	645 kg	Pipe Lax	246 l
XC-Polymer	12818 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 760

DIAND Land Use Permit N73A550

12

WELL NAME: Panarctic Dome et al Sherard Bay F-14

LATITUDE: 76° 13' 19" LONGITUDE: 108° 35' 51" STATUS: Abandoned

SPUD DATE: 7 Oct 1974 RIG RELEASE DATE: 31 Oct 1974 WELL DEPTH: 1343m

DRILL CAMP DIMENSIONS: 213 x 122m DRILLING WASTE SUMP DIMENSIONS: Not given

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m
T. Otter strip 457 x 122m
ACCESS ROADS: 25.7 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, two Foremost Delta 3 ATVs, two 30-ton oilfield trucks, two forklifts, one grader, one .5-ton truck

MUD COMPONENTS:

Gel	26090 kg	CMC	11 kg
Kelzan	2159 kg	Sawdust	1136 kg
Caustic soda	1329 kg	Walnut shells	272 kg
Chrome alum	572 kg	Spersene	284 kg
Sodium bicarbonate	1231 kg	Dowicide B	79 kg
XC-Polymer	806 kg	Aluminum stearate	11 kg
Barite	4727 kg	Ado-Foam	15 bbls
Sodium bichromate	363 kg	Hage-treat	113 kg
Paraformaldehyde	168 kg	Calgon	272 kg
Preservative	238 kg	Quickseal	454 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 773

DIAND Land Use Permit N74A838

13

WELL NAME: Panarctic et al Pedder Point D-49

LATITUDE: 75° 38′ 09″ LONGITUDE: 118° 48′ 15″ STATUS: Abandoned

SPUD DATE: 12 Oct 1974 RIG RELEASE DATE: 10 Nov 1974 WELL DEPTH: 1875m

DRILL CAMP DIMENSIONS: 304 x 152m DRILLING WASTE SUMP DIMENSIONS: 33 x 33 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 54.7 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, two Foremost Delta 3 ATVs, two 30-ton oilfield trucks, one grader, two forklifts, one .5-ton truck

MUD COMPONENTS:

XC-Polymer	2113 kg	Sawdust	454 kg
Bentonite	6136 kg	Mica	272 kg
Caustic soda	1545 kg	Walnut hulls	113 kg
Chrome alum	386 kg	Kwik Seal	272 kg
Sodium bicarbonate	272 kg	Diesel oil	10976 l
Barite	3090 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 774

DIAND Land Use Permit N74A853

14

WELL NAME: Dome Arctic Ventures Crocker I-53

LATITUDE: 80° 02 44 LONGITUDE: 98° 55′ 20″ STATUS: Abandoned

SPUD DATE: 12 June 1974 RIG RELEASE DATE: 5 Dec 1974 WELL DEPTH: 3584m

DRILL CAMP DIMENSIONS: 366 x 183m DRILLING WASTE SUMP DIMENSIONS: 36 x 27 x 5m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 24 km

WELL SITE VEHICLES: Two D-7 Caterpiller tractors, three 30-ton trucks, two forklifts, one grader, one .5-ton truck

MUD COMPONENTS: Not given in source

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit N73A527

15

WELL NAME: Panarctic Cape Fleetwood M-21

LATITUDE: 76° 30′ 47″ LONGITUDE: 103° 40′ 37″ STATUS: Abandoned

SPUD DATE: 23 Sept 1974 RIG RELEASE DATE: 7 Dec 1974 WELL DEPTH: 3514m

DRILL CAMP DIMENSIONS: 304 x 152m DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 14.4 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, one Foremost Delta 3 ATV, three 30-ton oilfield trucks, two .5-ton trucks, one grader, two forklifts

MUD COMPONENTS:	Gel	12181 kg
	Kelzan	7681 kg
	Chrome alum	977 kg
	Caustic soda	2318 kg
	Sawdust	2263 kg
	Lime	588 kg
	Barium carbonate	45363 kg
	Mica	750 kg
	Sodium bicarbonate	727 kg
	Sodium bichromate	840 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 771

DIAND Land Use Permit N74A852

16

WELL NAME: Panarctic Collingwood K-33

LATITUDE: 76′ 32 44 LONGITUDE: 108′ 43 27 STATUS: Abandoned

SPUD DATE: 28 Dec 1974 RIG RELEASE DATE: 18 Feb 1975 WELL DEPTH: 2046m

DRILL CAMP DIMENSIONS: 213 x 122m DRILLING WASTE SUMP DIMENSIONS: 30 x 30 x 4

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 1.6 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, two Foremost Delta 3 ATVs, two 30-ton oilfield trucks, two forklifts, one grader, one .5-ton truck

MUD COMPONENTS:	XC-Polymer	2250 kg
	Caustic soda	781 kg
	Chrome alum	359 kg
	Sodium bicarbonate	181 kg
	Gel	17100 kg
	Lime	318 kg
	Peltex	409 kg
	Barite	29363 kg
	Dowicide B	34 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 794

DIAND Land Use Permit N74A845

17

WELL NAME: Panarctic et al W. Bent Horn C-44

LATITUDE: 76° 22 10" LONGITUDE: 104° 19' 33" STATUS: Abandoned

SPUD DATE: 9 Jan 1975 RIG RELEASE DATE: 6 Apr 1975 WELL DEPTH: 3563m

DRILL CAMP DIMENSIONS: 305 x 152m DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 21.7 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, one Foremost Delta 3 ATV, three 30-ton oilfield trucks, two .5-ton trucks, one grader, two forklifts

MUD COMPONENTS:

Kelzan	9363 kg	Gel	22954 kg
Chrome alum	1641 kg	Barite	32727 kg
Lime	41 kg	Protomagic	182 kg
Sawdust	1430 kg	Sodium bichromate	227 kg
Caustic soda	2395 kg	Soda ash	1227 kg
Sodium bicarbonate	1302 kg	Walnut hulls	1182 kg
Dowcide B	273 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 796

18

WELL NAME: Panarctic Gulf et al East Drake I-55

LATITUDE: 76° 24 39" LONGITUDE: 107° 48' 54" STATUS: Gas Discovery

SPUD DATE: 6 Mar 1975 RIG RELEASE DATE: 16 Apr 1975 WELL DEPTH: 1109m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore Disposal

AIRSTRIP DIMENSIONS: Not given in source ACCESS ROADS: Not given in source

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not given in source

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 805

19

WELL NAME: Panarctic et al Pat Bay A-72

LATITUDE: 77° 21' 01"   LONGITUDE: 105° 26' 57"   STATUS: Abandoned

SPUD DATE: 28 Feb 1975   RIG RELEASE DATE: 6 May 1975   WELL DEPTH: 3230m

DRILL CAMP DIMENSIONS: 305 x 210m   DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: 1530 x 60m   ACCESS ROADS: Not given in source

WELL SITE VEHICLES: Three 30-tone oilfield trucks, two D-7 Caterpiller tractors, two forklifts, one grader, one .5-ton truck, one Foremost Delta 3 ATV

MUD COMPONENTS:

Barite	35863 kg	XC-Polymer	7445 kg
Bentonite	44909 kg	Kwik Seal	568 kg
Barium carbonate	272 kg	Lime	45 kg
Sodium bicarbonate	1136 kg	Mica	682 kg
Caustic soda	2922 kg	SAPP	68 kg
Chreme alum	1307 kg	Sawdust	2272 kg
Dowicide B	204 kg	Spersene	1250 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 797

DIAND Land Use Permit N74A833

20

WELL NAME: Panarctic Tenn et al Drake D-73

LATITUDE: 76° 22' 06"   LONGITUDE: 108° 29' 29"   STATUS: Gas Well

SPUD DATE: 23 Apr 1975   RIG RELEASE DATE: 10 May 1975   WELL DEPTH: 1361m

DRILL CAMP DIMENSIONS: 305 x 150m   DRILLING WASTE SUMP DIMENSIONS: 30 x 23 x 4m

AIRSTRIP DIMENSIONS: T. Otter strip 457 x 30m   ACCESS ROADS: 6.4 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, two Foremost Delta 3 ATV, two 30-ton oilfield trucks, two forklifts, one grader, one .5-ton truck

MUD COMPONENTS: Not given in source

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 812

DIAND Land Use Permit N75A986

WELL NAME: Elfex et al Wilkie Point J-51 21

LATITUDE: 76° 30' 31" LONGITUDE: 117° 19' 48" STATUS: Abandoned

SPUD DATE: 17 Mar 1975 RIG RELEASE DATE: 21 May 1975 WELL DEPTH: 2347m

DRILL CAMP DIMENSIONS: 180 x 180 m DRILLING WASTE SUMP DIMENSIONS: 45 x 54 x 4 m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m ACCESS ROADS: 66.3 km

WELL SITE VEHICLES: Three D-7 Caterpiller tractors, three 30-ton oilfield trucks, two forklifts, one 3-ton truck, two .5-ton trucks, one FN-60 vehicle

MUD COMPONENTS:

Gel	39113 kg	Dowicide B	35 kg
Pottasium chloride	1272 kg	Sawdust	2045 kg
Caustic soda	4454 kg	Bentonite	3636 kg
Kelzan	8011 kg	Supercol	5136 kg
Sodium bicarbonate	45 kg	Kwik Seal	2763 kg
Barite	52563 kg	Baroid	4818 kg
CMC	2590 kg	Biocide	19 l
Hydro-gel	681 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 803

DIAND Land Use Permit N74A920

WELL NAME: Panarctic et al Chads Creek B-64 22

LATITUDE: 76° 23 08 LONGITUDE: 109° 54' 21 STATUS: Abandoned

SPUD DATE: 6 Dec 1974 RIG RELEASE DATE: 27 June 1975 WELL DEPTH: 5036m

DRILL CAMP DIMENSIONS: 304 x 152m DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 42.6 km

WELL SITE VEHICLES: Three 30-ton oilfield trucks, two D-7 Caterpiller tractors, two forklifts, one grader, one Foremost Delta 3 ATV, one .5-ton truck

MUD COMPONENTS:

Bentonite	47545 kg	Kwikseal	6290 kg
Barite	941979 kg	Lignite	3386 kg
Calcium chloride	363 kg	Visbestos	5431 kg
Cello Flake	500 kg	Pipelax	1 bbl
Peltex	18477 kg	Sawdust	9750 kg
Walnut hulls	2431 kg	Lime	2181 kg
Sodium bicarbonate	3090 kg	Dowicide B	45 kg
Soda ash	635 kg	SAPP	470 kg
XC-Polymer	10840 kg	LD-7	303 l
Caustic soda	13727 kg	LD-8	38 l
Mica	4409 kg	Diesel oil	4719 l

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 788

DIAND Land Use Permit N74A850

WELL NAME: Panarctic Mocklin Point D-23 23

LATITUDE: 78° 22′ 08″ LONGITUDE: 104° 44′ 50″ STATUS: Abandoned

SPUD DATE: 5 June 1975 RIG RELEASE DATE: 20 July 1975 WELL DEPTH: 2802m

DRILL CAMP DIMENSIONS: 305 x 150m DRILLING WASTE SUMP DIMENSIONS: 38 x 38 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m
T. Otter strip 470 x 30m
ACCESS ROADS: 14.4 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, two 30-ton oilfield trucks, one 513T mobile crane, one 30T Foremost tracked vehicle, one AA70 Bombardier, two forklifts, one .5-ton truck, one Foremost Delta 3 ATV

MUD COMPONENTS:

Barite	139227 kg	Kwik Seal	600 kg
Bentonite	54318 kg	Lime	218 kg
Sodium bicarbonate	568 kg	Mica	591 kg
Caustic soda	2916 kg	Sodium bichromate	454 kg
Chrome alum	1493 kg	Sawdust	3981 kg
CMC	45 kg	Tannathin	227 kg
Dowicide B	113 kg	Visbestos	750 kg
Kelzan	6772 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 816

DIAND Land Use Permit N75A042

WELL NAME: Panarctic Bent Horn F-72 24

LATITUDE: 76° 21′ 27″ LONGITUDE: 103° 58′ 15″ STATUS: Abandoned

SPUD DATE: 21 May 1975 RIG RELEASE DATE: 24 Aug 1975 WELL DEPTH: 3216m

DRILL CAMP DIMENSIONS: Not given in source DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m
T.Otter strip 470 x 30m
ACCESS ROADS: 4.8 km 7.2 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, one Foremost Delta 3 ATV, three 30-ton oilfield trucks, two .5-ton trucks, one grader, two forklifts

MUD COMPONENTS:

Barite	91772 kg
Bentonite	4091 kg
XC-Polymer	6954 kg
Caustic soda	2154 kg
Chrome alum	1272 kg
Sodium bicarbonate	909 kg
Lime	523 kg
Sodium bichromate	1114 kg
Sawdust	1609 kg
Dowicide B	23 kg
Sodium acid pyrophosphate	90 kg
Paraformaldehyde	23 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 813

DIAND Land Use Permit N75A049

25

WELL NAME: Panarctic et al E. Hecla C-32

LATITUDE: 76° 20′ LONGITUDE: 110° 06′ STATUS: Gas Well

SPUD DATE: 7 Nov 1975 RIG RELEASE DATE: 10 Dec 1975 WELL DEPTH: 1341m

DRILL CAMP DIMENSIONS: 213 x 120m DRILLING WASTE SUMP DIMENSIONS: 30 x 23 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m
T. Otter strip 470 x 30m

ACCESS ROADS: 4.8 km 8.0 km
8.0 km

WELL SITE VEHICLES: One each D-6 and D-8 Caterpiller tractors, three 30-ton oilfield trucks, one 5-ton Foremost Yukon ATV, two forklifts, one .5-ton one grader

MUD COMPONENTS: Not given in source

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit N75A111

26

WELL NAME: Texex King Point West B-53

LATITUDE: 75° 32′ 03″ LONGITUDE: 108° 20′ 27″ STATUS: Abandoned

SPUD DATE: 29 Sept 1975 RIG RELEASE DATE: 2 Jan 1976 WELL DEPTH: 2137m

DRILL CAMP DIMENSIONS: 250 x 180m DRILLING WASTE SUMP DIMENSIONS: 50 x 50 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m
T. Otter strip 550 x 45m

ACCESS ROADS: 182.1 km

WELL SITE VEHICLES: Two D-7 Caterpiller tractors, one caterpiller grader, one D-4 Caterpiller tractor, one Foremost 511 tracked vehicle, one skidoo, two front-end loaders, two 30-ton oilfield trucks

MUD COMPONENTS:

Kelzan	8659 kg
Caustic soda	3568 kg
Soda ash	1727 kg
Sodium bicarbonate	1954 kg
Aquagel	26318 kg
Q-Broxin	68 kg
Baroid	36863 kg
Kwik Seal	3018 kg
Sawdust	3545 kg
Surflow W 300	22 kg
Mica-Tex	1136 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 811

DIAND Land Use Permit N74A864

WELL NAME: Elf et al Dyer Bay L-49 27

LATITUDE: 76° 08′ 35″ **LONGITUDE:** 121° 48′ 36″ **STATUS:** Abandoned

SPUD DATE: 1 Nov 1975 **RIG RELEASE DATE:** 20 Feb 1976 **WELL DEPTH:** 3171m

DRILL CAMP DIMENSIONS: 180 x 180m **DRILLING WASTE SUMP DIMENSIONS:** 45 x 75 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m **ACCESS ROADS:** Not given in source

WELL SITE VEHICLES: Three 30-ton oilfield trucks, two forklifts, one 3-ton truck, two .5-trucks, one each D-7 and D-8 Caterpiller tractors

MUD COMPONENTS:	Caustic soda	4954 kg	Sodium bicarbonate	818 kg
	Barite	139045 kg	Aluminum stearate	204 kg
	Gel	58988 kg	Alcohol	227 l
	Kelsen	7386 kg	Pottasium chloride	8045 kg
	CMC	409 kg	X-Pel-G	4095 kg
	Kwik Seal	6300 kg	Calgon	113 kg
	Sawdust	3381 kg	Haga Treat	900 kg
	Supercol	2022 kg	ADA foam	6 bbls
	Peltex	45 kg	Soap	35 bbls

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 824

DIAND Land Use Permit N75A005

WELL NAME: Panarctic et al Sabine Bay A-07 28

LATITUDE: 75° 26′ 06″ **LONGITUDE:** 110° 00′ 49″ **STATUS:** Abandoned

SPUD DATE: 23 Oct 1975 **RIG RELEASE DATE:** 24 Feb 1976 **WELL DEPTH:** 5193m

DRILL CAMP DIMENSIONS: 213 x 120m **DRILLING WASTE SUMP DIMENSIONS:** 30 x 20 x 3m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m **ACCESS ROADS:** 9.6 km

WELL SITE VEHICLES: Three 30-ton oilfield trucks, two D-7 Caterpiller tractors, two forklifts, one .5-ton truck, one grader, one Foremost Delta 3 ATV

MUD COMPONENTS:	Bentonite	42136 kg	Fine mica	1181 kg
	XC-Polymer	17386 kg	Paraformaldehyde	386 kg
	Chrome alum	2613 kg	LD-8 defoamer	227 l
	Caustic soda	11495 kg	Aluminum stearate	98 kg
	Salt ge	28445 kg	Salt	18709 kg
	Sodium bicarbonate	1000 kg	Pipelax	2 bbls
	Sawdust	818 kg	Kwik Seal	109 kg
	Barite	240636 kg	Hydrochloric acid	473 l
	Lignite	7040 kg	Corban	19 l
	Lime	227 kg	Triecone	814 l
	Walnut hulls	12863 kg	Drispac	340 kg
	Sodium chromate	2840 kg	K-91	386 kg
	Dowicide B	227 kg	Lube oil	2 bbls
	Peltex	4590 kg	Diesel oil	4296 l

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 808

DIAND Land Use Permit n75A099

29

WELL NAME: Panarctic W. Hecla P-62

LATITUDE: 76° 21′ 51″ LONGITUDE: 110° 52′ 34″ STATUS: Gas Discovery

SPUD DATE: 7 Jan 1976 RIG RELEASE DATE: 26 Feb 1976 WELL DEPTH: 1128m

DRILL CAMP DIMENSIONS: 213 x 122m DRILLING WASTE SUMP DIMENSIONS: 45 x 23 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 30m
T. Otter strip 457 x 30m

ACCESS ROADS: 8 km
4.8 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, three Kenworth 30-ton oilfield trucks, one 5-ton Foremost Yukon ATV, one grader, one .5-ton truck

MUD COMPONENTS:		
	Gel	6363 kg
	XC-Polymer	1181 kg
	Caustic soda	454 kg
	Barite	136636 kg
	Chrome alum	113 kg
	Peltex	863 kg
	Sodium bicarbonate	136 kg
	Lignite	545 kg
	Bentonite	545 kg
	Salt	45 kg

MISCELLANEOUS: Campsite near airstrip, dimensions: 150 x 150m

REFERENCES: COGLA. Well History Microfiche D.A. 822

DIAND Land Use Permit N75A111

30

WELL NAME: Panarctic et al Jackson Bay G-16

LATITUDE: 78° 05′ 21″ LONGITUDE: 101° 06′ 50″ STATUS: Abandoned

SPUD DATE: 5 Feb 1976 RIG RELEASE DATE: 15 Mar 1976 WELL DEPTH: 1201m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Not given in source ACCESS ROADS: Not given in source

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:		
	Barite	213090 kg
	Bentonite	35318 kg
	Gel	1363 kg
	Kelzan	1704 kg
	Caustic soda	840 kg
	Peltex	409 kg
	Tannathin	1409 kg
	Lignite	113 kg
	Walnut hulls	545 kg
	Sawdust	563 kg
	Mica	500 kg
	CMC	34 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 828

31

WELL NAME: Panarctic Tenn CS N.W. Hecla M-25

LATITUDE: 76° 27′ 45″ LONGITUDE: 111° 19′ 14″ STATUS: Gas Well

SPUD DATE: 14 Mar 1976 RIG RELEASE DATE: 18 Apr 1976 WELL DEPTH: 1207m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: 1580 x 60 m ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Barite	42727 kg
Bentonite	1681 kg
Caustic soda	522 kg
XC-Polymer	1113 kg
Gel	3772 kg
Sawdust	545 kg
SAPP	136 kg

MISCELLANEOUS:

REFERENCES: Panarctic Oils Limited. A Submission in Support of an Application for a Drilling Authority to Drill Panarctic N.W. Hecla P-58 Offshore Melville Island Northwest Territories. 1975.

32

WELL NAME: Panarctic W. Bent Horn E-43

LATITUDE: 76° 22′ 15″ LONGITUDE: 104° 18′ 44″ STATUS: Abandoned

SPUD DATE: 16 Jan 1976 RIG RELEASE DATE: 19 Apr 1976 WELL DEPTH: 3371m

DRILL CAMP DIMENSIONS: 300 x 150m DRILLING WASTE SUMP DIMENSIONS: 49 x 49 x 4m

AIRSTRIP DIMENSIONS: Not given in source ACCESS ROADS: 1.6 km
4.8 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpillar tractors, one Foremost Delta 3 vehicle, three 3-ton oilfield trucks, one grader, two .5-ton trucks, two forklifts

MUD COMPONENTS:

Barite	57090 kg	Calcium chloride	340 kg
Bentonite	28863 kg	Paraformaldehyde	227 kg
XC-Polymer	18000 kg	Kwik Seal	718 kg
Chrome alum	3313 kg	Fine mica	409 kg
Caustic soda	5795 kg	Aluminum stearate	23 kg
Sodium bicarbonate	363 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well history Microfiche D.A. 836

DIAND Land Use Permit N75A154

33

WELL NAME: Panarctic et al Jackson Bay G-16A

LATITUDE: 78° 05 21

LONGITUDE: 101° 06′ 50″

STATUS: Gas Discovery

SPUD DATE: 16 Mar 1976

RIG RELEASE DATE: 30 Apr 1976

WELL DEPTH: 1600m

DRILL CAMP DIMENSIONS: Ice platform

DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Not given in source

ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Barite	311772 kg	Soda ash	2954 kg
Bentonite	11954 kg	Protecto Magic	908 kg
Kelsan	3204 kg	Drispac	318 kg
Caustic soda	977 kg	Salt	454 kg
Gel	4954 kg	Lignite	1272 kg
Lime	1113 kg	Mica	386 kg
CMC	932 kg	Walnut hulls	636 kg
Peltex	522 kg	K-91 (O_2 scavenger)	90 kg
Sodium bicarbonate	1909 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 841

34

WELL NAME: Panarctic Tenn et al W. Hecla C-05

LATITUDE: 76° 24′ 08″

LONGITUDE: 110° 31′ 54″

STATUS: Abandoned

SPUD DATE: 28 Apr 1976

RIG RELEASE DATE: 16 May 1976

WELL DEPTH: 1237m

DRILL CAMP DIMENSIONS: 305 x 150m

DRILLING WASTE SUMP DIMENSIONS: 30 x 23 x 4m

AIRSTRIP DIMENSIONS: None

ACCESS ROADS: None

WELL SITE VEHICLES: One each D-6 and D-8 Caterpiller tractors, three 30-ton oilfield trucks, two forklifts, one Foremost Yukon ATV, one grader, one .5-ton truck

MUD COMPONENTS: Not given in source

MISCELLANEOUS: Staging of rig and camp components at Hecla F-62 airstrip

REFERENCES: EPS Land Use Application File NW 1287

35

WELL NAME: Panarctic et al West Bent Horn A-02

LATITUDE: 76° 21′ 05″ LONGITUDE: 104° 00′ 53″ STATUS: Oil Discovery

SPUD DATE: 26 May 1976 RIG RELEASE DATE: 1 Aug 1976 WELL DEPTH: 3361m

DRILL CAMP DIMENSIONS: 457 x 152m DRILLING WASTE SUMP DIMENSIONS: 49 x 49 x 4m

AIRSTRIP DIMENSIONS: Not given in source ACCESS ROADS: .8 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller t5actors, one Foremost Delta 3 ATV, three 30-ton oilfield trucks, two .75-ton trucks, one grader, two forklifts

MUD COMPONENTS:

Barite	126727 kg	Sodium bicarbonate	1363 kg
Bentonite	50636 kg	Plaster of Paris	898 kg
XC-Polymer	13954 kg	CMC	1226 kg
Chrome alum	2061 kg	Peltex	113 kg
Caustic soda	4204 kg	Spersene	272 kg
Paraformaldehyde	727 kg	Sodium chromate	227 kg
Lime	1552 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 844

DIAND Land Use Permit N75A145

36

WELL NAME: Panarctic et al Key Point O-51

LATITUDE: 76° 10′ 54″ LONGITUDE: 104° 20′ 04″ STATUS: Abandoned

SPUD DATE: 25 May 1976 RIG RELEASE DATE: 6 Sept 1976 WELL DEPTH: 3482m

DRILL CAMP DIMENSIONS: 304 x 152m DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 8.8 km 10.3 km
T. Otter strip 457 x 152m .5 km

WELL SITE VEHICLES: Two 30-ton oilfield trucks, one AA70 Bombardier snowmobile, two forklifts, one .75-ton truck, one Foremost 30T tracked vehicle, one Foremost Delta 3 ATV, one 513T mobile crane

MUD COMPONENTS:

Barite	145681 kg	K-91 lubricant	250 kg
Bentonite	24295 kg	XC-Polymer	9129 kg
Bunker C	7 bbls	Pipelax	4 bbls
Aluminum stearate	118 kg	Paraformaldehyde	227 kg
Chrome alum	1550 kg	SAPP	727 kg
Caustic soda	9150 kg	Sodium bichromate	272 kg
Diesel oil	99 bbls	Soda ash	45 kg
Drispac	136 kg	Salt	4000 kg
LD-8 defoamer	72 l	Sodium bichromate	958 kg
Imcolig	932 kg	Sawdust	3581 kg
Lime	22 kg	Visbestos	500 kg
Lube oil 10-20	18 bbls	Walnut hulls	614 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 845

DIAND Land Use Permit N75A146

WELL NAME: Panarctic Charles Point G-07 37

LATITUDE: 76° 26′ 20″ LONGITUDE: 103° 00′ 33″ STATUS: Abandoned

SPUD DATE: 10 Oct 1976 RIG RELEASE DATE: 7 Feb 1977 WELL DEPTH: 3864m

DRILL CAMP DIMENSIONS: 304 x 152m DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 29 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, Foremost Delta 3 ATV, three 3-ton oilfield trucks, two .75-ton trucks, one grader, two forklifts

MUD COMPONENTS:

Kelsan	13022 kg	Sodium Bicarbonate	772 kg
Chrome alum	2963 kg	Walnut hulls	3645 kg
Caustic soda	9943 kg	Paraformaldehyde	500 kg
Barite	73181 kg	Peltex	500 kg
Bentonite	13181 kg	SAPP	91 kg
CMC	91 kg	Adafoam	170 l
Sodium chromate	.500 kg	Will-do	549 l

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 852

EPS Land Use Application File NW1405

WELL NAME: Panarctic N.E. Drake P-40 38

LATITUDE: 76° 29′ 55″ LONGITUDE: 107° 11′ 53″ STATUS: Abandoned

SPUD DATE: 1 Feb 1977 RIG RELEASE DATE: 12 Mar 1977 WELL DEPTH: 1295m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: None ACCESS ROADS: Not given in source

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Bentonite	9181 kg
XC-Polymer	1863 kg
Caustic soda	977 kg
Salt	5090 kg
Barite	73272 kg
Lignite	91 kg
Sawdust	1454 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 859

39

WELL NAME: Panarctic S.W. Hecla C-58

LATITUDE: 76° 17' 04"

LONGITUDE: 111° 20' 52"

STATUS: Gas Well

SPUD DATE: 3 Apr 1977

RIG RELEASE DATE: 29 Apr 1977

WELL DEPTH: 1219m

DRILL CAMP DIMENSIONS: Ice platform

DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice Herc strip

ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Bentonite	5318 kg
XC-Polymer	795 kg
Caustic soda	591 kg
Salt	1318 kg
Barite	33000 kg
Sawdust	364 kg
Salt gel	909 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 858

Panarctic Oils Limited. A Submission in Support of an Application for a Drilling Authority to Drill Panarctic S.W. Hecla C-58 Offshore Melville Island Northwest Territories. 1976.

40

WELL NAME: Panarctic et al West Bunt Horn I-01A

LATITUDE: 76° 20' 53"

LONGITUDE: 104° 02' 13"

STATUS: Abandoned

SPUD DATE: 30 Nov 1976

RIG RELEASE DATE: 18 May 1977

WELL DEPTH: 3280m

DRILL CAMP DIMENSIONS: 304 x 152m

DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m

ACCESS ROADS: 3.2 km
1.6 km

WELL SITE VEHICLES: One D-6 and D-7 Caterpiller tractors, one Foremost Delta 3 ATV, three 30-ton oilfield trucks, two .75-ton trucks, one grader, two forklifts

MUD COMPONENTS: Not given in source

MISCELLANEOUS:

REFERENCES: EPS Land Use Application File NW1408

41

WELL NAME: Panarctic West Bent Horn M-12

LATITUDE: 76° 21′ 56″ **LONGITUDE:** 104° 06′ 52″ **STATUS:** Abandoned

SPUD DATE: 4 Mar 1977 **RIG RELEASE DATE:** 3 June 1977 **WELL DEPTH:** 3231m

DRILL CAMP DIMENSIONS: 304 x 152m **DRILLING WASTE SUMP DIMENSIONS:** 45 x 45 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m **ACCESS ROADS:** 3.2 km

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not given in source

MISCELLANEOUS:

REFERENCES: EPS Land Use Application File NW1508

42

WELL NAME: Panarctic AIEG et al Depot Island C-44

LATITUDE: 76° 23′ 14″ **LONGITUDE:** 114° 17′ 44″ **STATUS:** Abandoned

SPUD DATE: 19 Apr 1977 **RIG RELEASE DATE:** 10 June 1977 **WELL DEPTH:** 2669m

DRILL CAMP DIMENSIONS: 304 x 152m **DRILLING WASTE SUMP DIMENSIONS:** 38 x 38 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m
T. Otter strip 457 x 152 m **ACCESS ROADS:** 3.8 km

WELL SITE VEHICLES: Three 30-ton oilfield trucks, two D-7 Caterpiller tractors, two forklifts, one .75-ton truck, one grader, one Foremost Delta 3 ATV

MUD COMPONENTS:	Barite	39590 kg
	Bentonite	17954 kg
	XC-Polymer	6977 kg
	Chrome alum	1200 kg
	Caustic soda	3363 kg
	Sodium bicarbonate	91 kg
	Peltex	136 kg
	SAPP	409 kg
	Sawdust	9680 kg
	Paraformaldehyde	1182 kg
	Lime	23 kg
	Adafoam	265 l

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 874

EPS Land Use Application File NW1498

43

WELL NAME: Panarctic Sophie Point G-19

LATITUDE: 76° 18' 24" **LONGITUDE:** 103° 04' 59" **STATUS:** Abandoned

SPUD DATE: 29 May 1977 **RIG RELEASE DATE:** 30 Sept 1977 **WELL DEPTH:** 3792m

DRILL CAMP DIMENSIONS: 304 x 152m **DRILLING WASTE SUMP DIMENSIONS:** 45 x 45 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m **ACCESS ROADS:** 5.0 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractor, two 30-ton oilfield trucks, one mobile crane unit, one 30T Foremost tracked vehicle, one AA70 Bombardier snomobile, one 920 loader/forklift, one .75-ton truck, one forklift, one Delta 3 ATV

MUD COMPONENTS:

Kelzan	10318 kg	Tricen	114 l
Chrome alum	1890 kg	Mica	91 kg
Caustic soda	8625 kg	Sawdust	7045 kg
Bentonite	67209 kg	Sodium bicarbonate	182 kg
Barite	139681 kg	Protecto Magic	3181 kg
Walnut hulls	9250 kg	Lignite	182 kg
Paraformaldehyde	431 kg	CMC	45 kg
LD-8 defoamer	397 l	Barium carbonate	1659 kg
LD-7 defoamer	19 l	Oil	103 bbls
Will-do	511 l	Diesel oil	51 bbls
CMC	136 kg		

MISCELLANEOUS: 30 x 30 x 4m hole excavated to catch runoff water

REFERENCES: COGLA. Well History Microfiche D.A. 881

EPS Land Use Application File NW1584

44

WELL NAME: Panarctic et al Richardson Point G-12

LATITUDE: 75° 40' 03" **LONGITUDE:** 105° 39' 46" **STATUS:** Abandoned

SPUD DATE: 23 Oct 1977 **RIG RELEASE DATE:** 25 Jan 1978 **WELL DEPTH:** 3356m

DRILL CAMP DIMENSIONS: 304 x 152m **DRILLING WASTE SUMP DIMENSIONS:** 38 x 38 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m
T. Otter strip 457 x 30m
ACCESS ROADS: 35.4 km

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Kelzan	12250 kg	D3-30	6 bbls
Chrome alum	2204 kg	Paraformaldehyde	204 kg
Barite	59682 kg	Salt	2408 kg
Caustic	5636 kg	LD-7 defoamer	27 l
Bentonite	10818 kg	Sodium bicarbonate	1272 kg
Ursa LA-3 oil	10 bbls	Walnut hulls	136 kg
Nabob oil	29 bbls	Sparton oil	2500 kg
Pipelax	8 bbls	SAPP	95 kg
Diesel oil	205 bbls	Gel	2545 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 896

EPS Land Use Application File NW1594

WELL NAME: HB Norcen Phillips Cape Allison L-50 45

LATITUDE: 77° 49' 28" LONGITUDE: 100° 17' 57" STATUS: Abandoned

SPUD DATE: 8 Nov 1977 RIG RELEASE DATE: 4 Mar 1978 WELL DEPTH: 2122m

DRILL CAMP DIMENSIONS: 275 x 180m DRILLING WASTE SUMP DIMENSIONS: 49 x 73 x 3m

AIRSTRIP DIMENSIONS: Herc strip 1950 x 90m ACCESS ROADS: .4 km
.8 km

WELL SITE VEHICLES: Three 30-ton oilfield trucks, one D-6 and two D-7 Caterpiller tractors two 950 caterpiller loaders, one grader, two .5-ton trucks

MUD COMPONENTS:

Bentonite	38250 kg	SAPP	363 kg
Gel	28545 kg	Sodium bicarbonate	545 kg
Kelzan	13772 kg	Walnut hulls	17738 kg
Chrome alum	1672 kg	Wil-do	435 kg
Caustic soda	9556 kg	Protecto-majic	11772 kg
Barite	165818 kg	Pipelax	416 l
Lignite	2772 kg	Diesel oil	7973 l
Spersene	591 kg	Ada-foam	265 l

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 891

EPS Land Use Application File NW1615

WELL NAME: Panarctic et al AIEG Roche Point J-43 46

LATITUDE: 76° 42 45 LONGITUDE: 109° 46 22' STATUS: Gas Discovery

SPUD DATE: 18 Jan 1978 RIG RELEASE DATE: 18 Apr 1978 WELL DEPTH: 2882 m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip 1830 x 60m ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Salt gel	27545 kg
Kelzan	6872 kg
Caustic	5977 kg
Sodium bicarbonate	272 kg
Salt	12863 kg
Barite	167681 kg
Gel	41409 kg
CMC	545 kg
Lignite	465 kg
Mica	1227 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 892

Panarctic Oils Limited. A Submission in Support of an Application for a Drilling Authority to Drill Panarctic Roche Point I-43 Offshore Melville Island Northwest Territories. 1977.

47

WELL NAME: Panarctic Norcen AIEG et al Grassy 1-34

LATITUDE: 76° 23′ 43″ LONGITUDE: 113° 11′ 22″ STATUS: Abandoned

SPUD DATE: 3 Mar 1978 RIG RELEASE DATE: 22 Apr 1978 WELL DEPTH: 975m

DRILL CAMP DIMENSIONS: Not given in source DRILLING WASTE SUMP DIMENSIONS: Not given in source

AIRSTRIP DIMENSIONS: Not given in source ACCESS ROADS: Not given in source

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:	Kelzan	1590 kg
	Salt	7772 kg
	Bentonite	7409 kg
	Barite	62227 kg
	Caustic	227 kg
	Sodium bicarbonate	91 kg
	CMC	22 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 848

48

WELL NAME: Panarctic Drake F-76

LATITUDE: 76° 25′ 22″ LONGITUDE: 108° 28′ 47″ STATUS: Gas Well

SPUD DATE: 2 Mar 1978 RIG RELEASE DATE: 28 Apr 1978 WELL DEPTH: 1128m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Not given in source ACCESS ROADS: Not given in source

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:	Pottasium chloride	7363 kg
	Salt gel	11727 kg
	Chrome alum	559 kg
	Kelzan	2750 kg
	Barite	123227 kg
	Caustic soda	3545 kg

MISCELLANEOUS: Ice platform; experimental offshore well completion (see Section 2.3.4 of text)

REFERENCES: COGLA. Well History Microfiche D.A. 890

49

WELL NAME: Panarctic et al Beverly Inlet G-13

LATITUDE: 75° 02 20″ **LONGITUDE:** 108° 05′ 23″ **STATUS:** Abandoned

SPUD DATE: 20 Nov 1977 **RIG RELEASE DATE:** 23 June 1978 **WELL DEPTH:** 4061m

DRILL CAMP DIMENSIONS: 300 x 150m **DRILLING WASTE SUMP DIMENSIONS:** 38 x 38 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m
T. Otter strip 455 x 30 m

ACCESS ROADS: 370 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, one Foremost Delta 3 ATV, three 30-ton oilfield trucks, two .75-ton trucks, one grader, two forklifts

MUD COMPONENTS:

Bentonite	50000 kg	Soda ash	45 kg
Kelzan	15352 kg	Skot Free	265 l
Caustic soda	7420 kg	Wildo	624 l
Chrome alum	3159 kg	Gear oil	9198 l
Barite	341681 kg	Walnut hulls	2977 kg
Protecto Magic	6681 kg	Lubroclide	1602 kg
Diesel oil	21555 l	Defoamer	208 l
Peltex	318 kg	Aluminum stearate	80 kg
Paraformaldehyde	.318 kg	Used oil	340 l
Sodium bicarbonate	1318 kg	Surflo	246 l
SAPP	772 kg	Q-Broxin	363 kg
Dowicide B	159 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 894

DIAND Land Use Permit N77A673

50

WELL NAME: Panarctic et al Drake Point K-79

LATITUDE: 76° 28′ 35 **LONGITUDE:** 108° 58′ 48″ **STATUS:** Abandoned

SPUD DATE: 18 May 1978 **RIG RELEASE DATE:** 23 June 1978 **WELL DEPTH:** 1725 m

DRILL CAMP DIMENSIONS: 300 x 150m **DRILLING WASTE SUMP DIMENSIONS:** 30 x 30 x 4m

AIRSTRIP DIMENSIONS: Not given in source **ACCESS ROADS:** 16.0 km

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Bentonite	9818 kg	Salt gel	1090 kg
Kelzan	3136 kg	Sawdust	1818 kg
Caustic soda	1454 kg	CMC	5022 kg
Potassium chloride	18272 kg	Lignite	136 kg
Chrome alum	295 kg	Sodium bicarbonate	363 kg
Barite	19954 kg	Formaldehyde	45 kg
Drispac	272 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 904

EPS Land Use Application File NW 1969

51

WELL NAME: Panarctic et al Bent Horn A-57

LATITUDE: 76° 26 00   LONGITUDE: 103° 49′ 19″   STATUS: Abandoned

SPUD DATE: 23 May 1978   RIG RELEASE DATE: 29 Aug 1978   WELL DEPTH: 3627m

DRILL CAMP DIMENSIONS: 300 x 150 m   DRILLING WASTE SUMP DIMENSIONS: Not given in source

AIRSTRIP DIMENSIONS: Not given in source   ACCESS ROADS: 10.5 km 14.5 km

WELL SITE VEHICLES: Three 30-ton oilfield trucks, two D-7 Caterpiller tractors, one grader, two forklifts, .75-ton truck Foremost Delta 3 ATV

MUD COMPONENTS:	Barite	51909 kg	Paraformaldehyde	1013 kg
	Bentonite	80409 kg	Bennex	3 kg
	XC-Polymer	15465 kg	LD8	227 l
	Chrome alum	2836 kg	Kwik Seal	809 kg
	Caustic soda	5125 kg	Sawdust	2863 kg
	Lime	45 kg	Diesel oil	303 l
	Sodium bicarbonate	3909 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 903

EPS Land Use Application File NW 1953

52

WELL NAME: Panarctic et al Stokes Range J-11

LATITUDE: 76° 20 34′   LONGITUDE: 101° 35′ 03″   STATUS: Abandoned

SPUD DATE: 31 May 1978   RIG RELEASE DATE: 17 Sept 1978   WELL DEPTH: 3340m

DRILL CAMP DIMENSIONS: 300 x 150m   DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: 1830 x 60m   ACCESS ROADS: 58 km 3.2 km 2 km
3.2 km 6.4 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, Foremost Delta 3 ATV, two 30-ton oilfield trucks, one .75-ton truck, one grader, one forklift, one mobile crane, one each 920 and 930 loader/forklift, one skidozer

MUD COMPONENTS:	Barite	263208 kg	Pit Plug	113 kg
	Bentonite	60631 kg	Bennex	21 kg
	XC-Polymer	10368 kg	Sawdust	6340 kg
	Chrome alum	2027 kg	ADO Foam	840 l
	Caustic soda	4043 kg	Calgon	216 l
	Lime	3590 kg	Corban	76 l
	Alum stearate	838 kg	Mica	704 kg
	Sodium bicarbonate	954 kg	Protecto Magic	279 kg
	Paraformaldehyde	227 kg	Kwik Seal	363 kg
	Lignite	352 kg	CMC	45 kg
	SAPP	227 kg	Diesel oil	757 l

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 902

EPS Land Use Application File NW 1777

53

WELL NAME: Panarctic et al Noice D-41

LATITUDE: 78° 20′ 01″ LONGITUDE: 104° 24′ 32″ STATUS: Abandoned

SPUD DATE: 4 Nov 1978 RIG RELEASE DATE: 2 Jan 1979 WELL DEPTH: 2347m

DRILL CAMP DIMENSIONS: 305 x 152m DRILLING WASTE SUMP DIMENSIONS: 61 x 30 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m ACCESS ROADS: 10 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, one grader, one .75-ton truck, one mobile crane, one Delta 3 ATV

MUD COMPONENTS:

Bentonite	7204 kg	Kwik Seal	295 kg
Barite	39250 kg	Sawdust	568 kg
Kelzan	6409 kg	Salt gel	3931 kg
Chrome alum	[illegible] kg	Sodium bicarbonate	568 kg
Caustic soda	[illegible]	SAPP	431 kg
Aluminum stearate	[illegible]	Calcium chloride	340 kg
Mica	181 kg	Paraformaldehyde	750 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 917

54

WELL NAME: Dome Panarctic et al Hoodoo E-05

LATITUDE: 78° 04′ 16″ LONGITUDE: 99° 33′ 47″ STATUS: Abandoned

SPUD DATE: 8 Nov 1978 RIG RELEASE DATE: 3 Jan 1979 WELL DEPTH: 2476m

DRILL CAMP DIMENSIONS: 300 x 150m DRILLING WASTE SUMP DIMENSIONS: 45 x 30 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m
T. Otter strip 450 x 30m ACCESS ROADS: 6.4 km

WELL SITE VEHICLES: One each D-4 and D-7 Caterpiller tractors, one grader, two LW924 trucks, two loaders, one Foremost Delta 3 ATV, one .75-ton truck

MUD COMPONENTS:

XC-Polymer	3068 kg	Aluminum stearate	45 kg
Chrome alum	227 kg	Coat 888	1454 kg
Caustic soda	3000 kg	Alcomer 120	590 kg
Bentonite	10363 kg	Nickle sulfate	68 kg
Barite	30704 kg	Spersene	568 kg
Sodium bicarbonate	727 kg	Drispac	136 kg
Kwik Seal	204 kg	Walnut hulls	1432 kg
Potassium chloride	14886 kg	Torqueless	886 kg
Sawdust	1590 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 923

EPS Land Use Application File NW 6094

WELL NAME: Panarctic AIEG et al Desbarats B-73 55

LATITUDE: 76° 42′ 13″ **LONGITUDE:** 105° 57′ 15″ **STATUS:** Abandoned

SPUD DATE: 17 Feb 1979 **RIG RELEASE DATE:** 27 Mar 1979 **WELL DEPTH:** 1085m

DRILL CAMP DIMENSIONS: Ice platform **DRILLING WASTE SUMP DIMENSIONS:** Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip **ACCESS ROADS:** None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

XC-Polymer	1021 kg
bentonite	10080 kg
Caustic soda	635 kg
Salt gel	4265 kg
Barite	38375 kg
Spersene	136 kg
Sodium chloride	998 kg
Lignite	113 kg

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: COGLA. Well history Microfiche D.A. 919

"Environmental Review of Panarctic Oils Limited Offshore Drilling Operations in the High Arctic 1979 Season." Prepared by E. Ladouceur, DIAND, Yellowknife, NWT. 1979.

Panarctic Oils Limited. "A Submission in Support of an Application to Drill Panarctic AIEG et al Desbarats O-57 Offshore Desbarats Strait Northwest Territories." 1977.

WELL NAME: Phillips et al Hazen Strait F-54 56

LATITUDE: 77° 03′ 30″ **LONGITUDE:** 110° 24′ 11″ **STATUS:** Abandoned

SPUD DATE: 11 Feb 1979 **RIG RELEASE DATE:** 12 May 1979 **WELL DEPTH:** 3064m

DRILL CAMP DIMENSIONS: Ice platform **DRILLING WASTE SUMP DIMENSIONS:** Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip **ACCESS ROADS** None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Bentonite	56227 kg	Aluminum stearate	68 kg
Kelzen	7738 kg	Kwik Seal	290 kg
Barite	145721 kg	CMC	3035 kg
Caustic soda	11319 kg	Lime	2423 kg
Salt gel	2610 kg	Lignite	3399 kg
Salt	2721 kg	Walnut hulls	608 kg
Mica	1293 kg	Sodium bicarbonate	90 kg

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: COGLA. Well history Microfiche D.A. 912

"Environmental Review of Panarctic Oils Limited Offshore Drilling Operations in the High Arctic 1979 Season". Prepared by E. Ladouceur, DIAND, Yellowknife NWY. 1979.

Tri Ocean Engineering Limited. "A Submission in Support of a Drilling Authority to Drill Phillips et al Hazen Strait F-64 Offshore Mackenzie King Island Northwest Territories." Prepared for Phillips Petroleum Canada Limited, 1978.

57

WELL NAME: Panarctic AIEG Whitefish H-63

LATITUDE: 77° 11′ 49″ **LONGITUDE:** 106° 44′ 24″ **STATUS:** Gas Discovery

SPUD DATE: 18 Oct 1978 **RIG RELEASE DATE:** 17 May 1979 **WELL DEPTH:** 2126m

DRILL CAMP DIMENSIONS: Ice platform **DRILLING WASTE SUMP DIMENSIONS:** Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip **ACCESS ROADS:** None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:		
	Barite	141250 kg
	Bentonite	28803 kg
	Caustic soda	3175 kg
	Kelzan	1724 kg
	Drispac	862 kg
	Spersene	930 kg
	Peltex	45 kg
	Sodium bicarbonate	45 kg

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: COGLA. Well History Microfiche D.A. 911

"Environmental Review of Panarctic Oils Limited Offshore Drilling Operations in the High Arctic 1979 Season". Prepared by E. Ledouceur, DIAND, Yellowknife, NWT. 1979

Tri Ocean Engineering Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Panarctic AIEG Whitefish M-32 Offshore Melville Island Northwest Territories." Prepared for Panarctic Oils Limited, 1978.

58

WELL NAME: Mobil Cornwall O-30

LATITUDE: 77° 29′ 46″ **LONGITUDE:** 94° 39′ 08″ **STATUS:** Abandoned

SPUD DATE: 5 June 1979 **RIG RELEASE DATE:** 14 Oct 1979 **WELL DEPTH:** 3584m

DRILL CAMP DIMENSIONS: 305 x 150m **DRILLING WASTE SUMP DIMENSIONS:** 91 x 30 x 4m

AIRSTRIP DIMENSIONS: 1830 x 60m **ACCESS ROADS:** 2.4 km

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not given in source

MISCELLANEOUS:

REFERENCES: EPS Land Use Application File NW 6296

WELL NAME: Panarctic AIEG Dome PPC Char G-07 59

LATITUDE: 77° 36 25' **LONGITUDE:** 99° 31' 08" **STATUS:** Oil & Gas Discovery

SPUD DATE: 5 Feb 1980 **RIG RELEASE DATE:** 22 April 1980 **WELL DEPTH:** 2179m

DRILL CAMP DIMENSIONS: Ice Platform **DRILLING WASTE SUMP DIMENSIONS:** Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip **ACCESS ROADS:** None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Barite	158409 kg
Bentonite	22454 kg
Salt gel	1091 kg
Kelzan	4182 kg
Caustic soda	3250 kg
Sodium bicarbonate	727 kg
Salt	454 kg

MISCELLANEOUS:
- Second ice platform constructed for relief well rig
- 271m^3 urethane foam blocks incorporated into main ice platform; blocks disposed of by burning on rig site
- 567 kg chrome lignosulphonate spread on ice surface to accelerate melting around foam blocks prior to burning

REFERENCES: "Review of Environmental Operating Conditions for Panarctic Oils Limited Offshore Drilling Operations High Arctic 1980 Season." Prepared by E. Ladouceur, DIAND Yellowknife, NWT. 1980

WELL NAME: Panarctic AIEG PPC Balaena D-58 60

LATITUDE: 77° 37' 11' **LONGITUDE:** 100° 22' 24" **STATUS:** Oil trace

SPUD DATE: 6 Feb 1980 **RIG RELEASE DATE:** 27 Apr 1980 **WELL DEPTH:** 1874m

DRILL CAMP DIMENSIONS: Ice platform **DRILLING WASTE SUMP DIMENSIONS:** Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip **ACCESS ROADS:** None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Kelzan	2340 kg
Bentonite	3182 kg
Caustic soda	2000 kg
Salt gel	18909 kg
Barite	127454 kg
Salt	7590 kg
Sawdust	3409 kg
Staflo	954 kg
Mica	364 kg
Sodium bicarbonate	227 kg
Diesel oil	1910 l
B-Free	320 l

MISCELLANEOUS:

REFERENCES: "Review of Environmental Operating Conditions for Panarctic Oils Limited Offshore Drilling Operations High Arctic 1980 Season." Prepared by E. Ladouceur, DIAND Yellowknife, NWT. 1980.

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WELL NAME: Panarctic AIEG Whitefish 2H-63

LATITUDE: 77° 12 24 LONGITUDE: 106° 53' 25" STATUS: Gas Well

SPUD DATE: 3 Dec 1979 RIG RELEASE DATE: 15 May 1980 WELL DEPTH: 3003m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Barite	576018 kg	Walnut hulls
Bentonite	41731 kg	Salt
Caustic Soda	7601 kg	Mica
Kelzan	9934 kg	Lignite
Drispac	444 kg	Staflo
Spersene	885 kg	Chrom alum
Sodium bicarbonate	409 kg	B-Free
Salt gel	.18066 kg	Scot-Free
Kwik Seal	6296 kg	

MISCELLANEOUS:
- Second ice platform constructed for relief well rig
- Alleged unauthorized dumping of unknown quantities of incinerator waste and scrap metal, several hundred barrels of petroleum products, several thousand pounds of barite and cement, unknown quantities of drilling mud additives; infractions alleged to have taken place 10-17 May, 1980.

REFERENCES: EPS File 4700-5, Memorandum 16 Dec 1980 (Alleged Dumping Infraction)

"Review of Environmental Operating Conditions for Panarctic Oils Limited Offshore Drilling Operations High Arctic 1980 Season." Prepared by E. Ladouceur, DIAND Yellowknife N.W.T. 1980

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WELL NAME: Dome Wallis H-73

LATITUDE: 77° 52 23" LONGITUDE: 102° 27' 09" STATUS: Abandoned

SPUD DATE: 16 Mar 1980 RIG RELEASE DATE: 23 Aug 1980 WELL DEPTH: 2827m

DRILL CAMP DIMENSIONS: 300 x 150m DRILLING WASTE SUMP DIMENSIONS: 90 x 25 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1580 x 60m
T. Otter strip 610 x 30m
ACCESS ROADS: 2.1 km 4 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, three 30-ton oilfield trucks, one forklift, one grader, two .75-ton trucks

MUD COMPONENTS: Not given in source

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit N80A238

WELL NAME: Panarctic AIEG Vesey A-27 63

LATITUDE: 76° 51′ 07″ **LONGITUDE:** 109° 09′ 10″ **STATUS:** Abandoned

SPUD DATE: 8 June 1980 **RIG RELEASE DATE:** 9 Sept 1980 **WELL DEPTH:** 2922m

DRILL CAMP DIMENSIONS: 150 x 150m **DRILLING WASTE SUMP DIMENSIONS:** 91 x 30 x.4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m **ACCESS ROADS:** 53 km 4.8 km

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Barite	139333 kg	Soda ash	340 kg
Bentonite	18800 kg	Walnut hulls	182 kg
Kelzan	6833 kg	Sodium bicarbonate	91 kg
Caustic soda	4200 kg	SAPP	68 kg
X-Pel G	2066 kg	Q-Broxin	45 kg
Chrome alum	953 kg	LD-8	45 kg
Protectomagic	772 kg	Aluminum stearate	23 kg
Paraformaldehyde	500 kg	Diesel oil	29391 l
Spersene	477 kg	B-Free	2250 l
Sta Flo	386 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 960

EPS Land Use Application File NW 6739

WELL NAME: Panarctic AIEG PPC Dome Skate B-80 64

LATITUDE: 77° 49′ 13″ **LONGITUDE:** 104° 57′ 18″ **STATUS:** Oil & Gas Discovery

SPUD DATE: 20 Feb 1981 **RIG RELEASE DATE:** 4 Apr 1981 **WELL DEPTH:** 1655m

DRILL CAMP DIMENSIONS: Ice platform **DRILLING WASTE SUMP DIMENSIONS:** Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip **ACCESS ROADS:** None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Barite	288776 kg
Attapulgite	15682 kg
Bentonite	48364 kg
XC-Polymer	3725 kg
Caustic soda	1408 kg
Kwik-Seal	4765 kg
Walnut hulls	1661 kg
Salt	4682 kg
Mica	3659 kg
Sawdust	600 kg
Spersene	1090 kg
Nut Plug	296 kg

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Panarctic AIEG PPC Dome Skate B-80 Offshore Lougheed Island Northwest Territories." 1980.

WELL NAME: Panarctic AIEG Phillips Cisco B-66 65

LATITUDE: 77° 24′ 18″ **LONGITUDE:** 106° 26′ 02″ **STATUS:** Oil & Gas Discovery

SPUD DATE: 1 Feb 1981 **RIG RELEASE DATE:** 4 May 1981 **WELL DEPTH:** 2412m

DRILL CAMP DIMENSIONS: Ice platform **DRILLING WASTE SUMP DIMENSIONS:** Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip **ACCESS ROADS:** None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Barite	212945 kg	Carboxymethyl cellulose	1150 kg
Attapulgite	23545 kg	SAPP	920 kg
Bentonite	1045 kg	Mica	240 kg
XC-Polymer	7427 kg	Sawdust	2700 kg
Caustic soda	4765 kg	B-Free	3812 l
Sodium bicarbonate	2265 kg	Sta-Flo	3740 l
Potassium chloride	76870 kg	Soda ash	120 kg
Lignite	800 kg	Spersene	730 kg

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for an Application for a Drilling Authority to Drill Panarctic AIEG Phillips Cisco E-65 Offshore Lougheed Island Northwest Territories. 1980.

WELL NAME: Panarctic AIEG PPC Dome Maclean I-72 66

LATITUDE: 77° 31′ 39″ **LONGITUDE:** 103° 56′ 22″ **STATUS:** Oil & Gas Discovery

SPUD DATE: 27 Jan 1981 **RIG RELEASE DATE:** 4 May 1981 **WELL DEPTH:** 2475m

DRILL CAMP DIMENSIONS: Ice platform **DRILLING WASTE SUMP DIMENSIONS:** Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip **ACCESS ROADS:** Not given in source

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Barite	224439 kg	Mica	1023 kg
Attapulgite	9759 kg	Sawdust	364 kg
Bentonite	53738 kg	Lime	181 kg
XC-Polymer	8875 kg	B-Free	182 l
Caustic soda	5061 kg	Staflo	2650 kg
Sodium bicarbonate	636 kg	Soda ash	1409 kg
Lignite	45 kg	Spersene	2409 kg
Walnut hulls	2455 kg	Diesel oil	10300 l
Salt	4636 kg		

MISCELLANEOUS:
--Second ice platform constructed for relief well rig
--550m^3 urethane foam blocks used in ice platform; disposed of by burning at well site

REFERENCES: "Environmental Review of Panarctic Oils Limited Offshore Drilling Operations in the High Arctic 1981 Season." Prepared by S.Liebou and E. Ledouceur, DIAND, Yellowknife N.T. 1982.

Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Panarctic AIEG PPC Dome Maclean I-72 Offshore Lougheed Island Northwest Territories." 1980.

WELL NAME: Panarctic W. Bent Horn G-02 67

LATITUDE: 76° 21′ 21″ **LONGITUDE:** 104° 01′ 14″ **STATUS:** Abandoned

SPUD DATE: 29 May 1981 **RIG RELEASE DATE:** 4 Sept 1981 **WELL DEPTH:** 3220m

DRILL CAMP DIMENSIONS: 150 x 150m **DRILLING WASTE SUMP DIMENSIONS:** 91 x 30 x 4m

AIRSTRIP DIMENSIONS: Not given in source **ACCESS ROADS:** 2 km

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not given in source

MISCELLANEOUS: Excessive ground disturbance noted at wellsite during spring and summer (1982) inspections by EPS staff

REFERENCES: EPS Land Use Application File Nw 9220
EPS File Nw 9476 (Inspection Report)

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See overleaf for Panarctic Dome et al

Hoodoo N-52 well description

WELL NAME: Panarctic Dome et al hoodoo N-52 68 (cont'd)

LATITUDE: 78° 11′ 59″ **LONGITUDE:** 99° 58′ 22″ **STATUS:** Abandoned

SPUD DATE: 29 Sept 1981 **RIG RELEASE DATE:** 11 Nov 1981 **WELL DEPTH:** 1650m

DRILL CAMP DIMENSIONS: 300 x 300m **DRILLING WASTE SUMP DIMENSIONS:** 61 x 30 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m **ACCESS ROADS:** 24 km
3 km

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: See below

Chemical analyses and total solids breakdown of waste drilling fluid samples, Hoodoo N-52 well.

		Sample #1	Sample #2	Sample #3	Sample #4	Sample #5	Sample #6
Sample Number		3847	6705	6709	6710	6734	6742
Depth (m)		350	650	850	1050	1330	1650
Total Mercury	µg/L	2.0	6.85	94.6	51.0	86	63
Total Copper	mg/L	0.71	2.53	3.17	1.64	9.32	7.08
Total Lead	mg/L	1.32	6.22	15.98	1.74	46.5	15.35
Total Chromium	mg/L	0.24	6.83	1.73	0.17	7.64	2.68
Total Cadmium	mg/L	0.27	0.37	0.29	0.10	1.25	0.55
Total Nickel	mg/L	9.17	16.28	29.46	9.42	26.5	28.15
Total Zinc	mg/L	18.2	6.09	9.80	22.6	50.9	26.06
Dissolved Mercury	µg/L	1.1	0.82	1.52	0.87	<0.1	1.2
Dissolved Copper	mg/L	<0.005	0.09	0.07	0.07	0.04	0.08
Dissolved Lead	mg/L	<0.02	0.11	0.15	0.12	0.22	<0.02
Dissolved Chromium	mg/L	<0.01	0.08	0.05	0.09	0.03	<0.01
Dissolved Cadmium	mg/L	0.25	<0.01	0.01	0.01	<0.01	<0.01
Dissolved Nickel	mg/L	0.13	0.08	0.04	0.04	0.10	0.26
Dissolved Zinc	mg/L	0.21	0.12	0.08	0.05	0.16	0.78
Dissolved Potassium	mg/L	111	56,880	49,720	26,220	14,400	26,600
pH		6.22	8.66	9.89	7.84	11.16	10.73
Conductivity	mS/cm	4.18	92.61	123.5	68.36	58.76	86.04
Density		1.7504	1.1321	1.1586	1.3006	1.270	1.121
Chloride	mg/L	493	21,750	30,250	20,750	36,000	46,000
Total Solids	mg/L	487,380	196,620	235,760	233,660	450,160	228,575
Suspended Solids	mg/L	309,100	112,312	129,676	201,540	399,100	162,400
Chemical Oxygen Demand	mg/L	5,200	1,680	3,880	4,080	6,720	15,760
Oil and Grease	mg/L	43	23	34	42	115	119

MISCELLANEOUS: 950m^3 of drilling fluid spread on land 29 Sept-10 Nov 1981 to examine the feasibility of surficial drill fluid disposal. Effluent was enclosed w/i snow berms; fluids were evenly spread over .15 km^2 area at average thickness of 1.5-2.0m. After thaw, some effluent entered Hoodoo Creek and Hoodoo River.

REFERENCES: EPS Land Use Application File NW 9193

EPS File 4663-4-2 (Surface disposal of drilling fluids)

"Surface Disposal Experiment of Waste Drilling Fluids, Hoodoo N-52 Well, Ellef Ringnes Island, N.W.T. Initial Report Phase One." Prepared for Panarctic Oils Limited., Calgary, by French Arctic Consultants Limited. March 1982.

"Surface Disposal Experiment of Waste Drilling Fluids, Hoodoo N-52 Well, Ellef Ringnes Island, N.W.T. Phase Two Report." Prepared for Panarctic Oils Limited, Calgary, by French Arctic Consultants Limited. December, 1982.

WELL NAME: Panarctic et al Cisco C-42

LATITUDE: 77° 21′ 13″ **LONGITUDE:** 106° 17′ 13″ **STATUS:** Oil Well

SPUD DATE: 2 March 1982 **RIG RELEASE DATE:** 20 April 1982 **WELL DEPTH:** 1750 m

DRILL CAMP DIMENSIONS: Ice platform **DRILLING WASTE SUMP DIMENSIONS:** Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip **ACCESS ROADS:** None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not given in source

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Pnarctic et al Cisco F-42 Offshore Lougheed Island Northwest Territories." 1981.

WELL NAME: Panarctic et al Cape Mamen F-24 70

LATITUDE: 77° 33' 15" **LONGITUDE:** 109° 07' 29" **STATUS:** Abandoned

SPUD DATE: 15 Jan 1982 **RIG RELEASE DATE:** 28 Apr 1982 **WELL DEPTH:** 2925m

DRILL CAMP DIMENSIONS: Ice platform **DRILLING WASTE SUMP DIMENSIONS:** Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip **ACCESS ROADS:** None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Attapulgite	65080 kg	SAPP	181 kg
Bentonite	93343 kg	Nut Plug	8054 kg
Barite	100200 kg	Staflo	4017 kg
Kelzan	16593 kg	Sodium bicarbonate	181 kg
Salt	15753 kg	Spersene	1203 kg
Caustic soda	11395 kg	Kwik Seal	21376 kg
Sawdust	30855 kg	Mica	5084 kg
Lime	272 kg	Lignite	90 kg

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: COGLA. Well History Microfiche D.A. 987

Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Panarctic et al Cape Mamen F-24 Offshore Mackenzie King Island Northwest Territories." 1981.

WELL NAME: Panarctic et al Whitefish A-26 71

LATITUDE: 77° 15' 09" **LONGITUDE:** 106° 38' 13" **STATUS:** Abandoned

SPUD DATE: 15 Jan 1982 **RIG RELEASE DATE:** 30 Apr 1982 **WELL DEPTH:** 2817m

DRILL CAMP DIMENSIONS: Ice platform **DRILLING WASTE SUMP DIMENSIONS:** Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip **ACCESS ROADS:** None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Kelzan	10125 kg
Attapulgite	14659 kg
Caustic	10850 kg
Barite	305494 kg
Staflo	4675 kg
CMC	2045 kg
Spersene	2340 kg
Salt	3363 kg
Mica	2800 kg
Kwik Seal	4200 kg
Walnut hulls	2795 kg
Sawdust	11862 kg
Sodium bicarbonate	1363 kg

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Panarctic et al Whitefish P-25 Offshore Lougheed Island Northwest Territories." 1981.

Panarctic Oils Limited. "Well History Report Panarctic et al Whitefish A-26." 1982.

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WELL NAME: Panarctic et al Sculpin K-08

LATITUDE: 78° 07′ 19″ **LONGITUDE:** 104° 33′ 55″ **STATUS:** Gas Discovery

SPUD DATE: 29 Jan 1982 **RIG RELEASE DATE:** 3 May 1982 **WELL DEPTH:** 1850m

DRILL CAMP DIMENSIONS: Ice platform **DRILLING WASTE SUMP DIMENSIONS:** Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip **ACCESS ROADS:** None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Barite	294680 kg	Walnut hulls	749 kg
Pottasium chloride	106125 kg	SAPP	749 kg
Attapulgite	54253 kg	Sodium bicarbonate	636 kg
Kelsan	12775 kg	Torqueless	250 kg
Bentonite	12303 kg	Imco Fibre	146 kg
Caustic soda	6878 kg	Nickel sulfate	136 kg
Kwik Seal	5242 kg	Lime	45 kg
Staflo	4125 kg	Diesel oil	14450 l
Salt	3405 kg	Motor oil	1636 l
Sawdust	2088 kg	Coat 129	860 l
Spersene	2066 kg	Methyl alcohol	400 l
Coat 888	1589 kg	B-Free	349 l
Mica	1453 kg	Surflo H-35	240 l

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: COGLA. Well History Microfiche D.A. 986

Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Panarctic et al Sculpim E-08 Offshore Ellef Ringnes Island Northwest Territories." 1981.

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WELL NAME: Panrctic et al Cisco K-58

LATITUDE: 77° 27′ 33″ **LONGITUDE:** 106° 21′ 14″: **STATUS:** Oil Well

SPUD DATE: 12 Dec 1982 **RIG RELEASE DATE:** 1 Feb 1983 **WELL DEPTH:** 2240m

DRILL CAMP DIMENSIONS: Ice platform **DRILLING WASTE SUMP DIMENSIONS:** Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip **ACCESS ROADS:** None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not given in source

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Panarctic et al Cisco K-58 Offshore Lougheed Island Northwest Territories." 1982.

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WELL NAME: Panarctic et al Cape Macmillan 2K-15

LATITUDE: 77° 44' 45"
LONGITUDE: 99° 06' 58"
STATUS: Oil & Gas Discovery

SPUD DATE: 3 Feb 1983
RIG RELEASE DATE: 12 Apr 1983
WELL DEPTH: 2090m

DRILL CAMP DIMENSIONS: Ice platform
DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip
ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not given in source

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Panarctic et al Cape Macmillan M-15 Offshore Ellef Ringnes Island Northwest Territories." 1982.

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WELL NAME: Panarctic et al Grenadier A-26

LATITUDE: 77° 24' 04"
LONGITUDE: 99° 34' 55"
STATUS: Abandoned

SPUD DATE: 11 Jan 1983
RIG RELEASE DATE: 17 Apr 1983
WELL DEPTH: 2766 m

DRILL CAMP DIMENSIONS: Ice platform
DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip
ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not given in source

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Panarctic et al Grenadier B-15 Offshore Ellef Ringnes Island Northwest Territories." 1982.

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WELL NAME: Panarctic et al Maryatt Point K-71

LATITUDE: 76° 20′ 37″ **LONGITUDE:** 108° 58′ 25″ **STATUS:** Abandoned

SPUD DATE: 14 Oct 1982 **RIG RELEASE DATE:** 17 July 1983 **WELL DEPTH:** 5300m

DRILL CAMP DIMENSIONS: 500 x 500m **DRILLING WASTE SUMP DIMENSIONS:** 122 x 30 x 4m

AIRSTRIP DIMENSIONS: 1830 x 60m **ACCESS ROADS:** 14.5 km 4 km
47.5 km

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not given in source

MISCELLANEOUS: Temporary gas line (3600m of 61mm tubing and 11,525m of 38mm tubing) installed on ground surface to transport methane from Drake F-16 well (76 25 15, 108 35 38) to Maryatt K-71 wellsite; methane used as camp fuel

REFERENCES: EPS Land Use Application File NW 9599

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WELL NAME: Panarctic et al Cisco M-22

LATITUDE: 77° 22′ 00″ **LONGITUDE:** 106° 11′ 11″ **STATUS:** Abandoned

SPUD DATE: 22 Jan 1984 **RIG RELEASE DATE:** 12 Apr 1984 **WELL DEPTH:** 2367m

DRILL CAMP DIMENSIONS: Ice platform **DRILLING WASTE SUMP DIMENSIONS:** Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip **ACCESS ROADS:** None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not available at time of research

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for Drilling Program Approval to Drill Panarctic et al Cisco D-23 Offshore Lougheed Island Northwest Territories." 1983.

WELL NAME: Panarctic et al Skate C-59 78

LATITUDE: 77° 48' 14" LONGITUDE: 104° 51' 36" STATUS: Gas Well

SPUD DATE: 15 Jan 1984 RIG RELEASE DATE: 13 Apr 1984 WELL DEPTH: 2300m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not available at time of research

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Program Approval to Drill Panarctic et al Skate D-59 Offshore Lougheed Island Northwest Territories." 1983.

WELL NAME: Panarctic et al Sherard Bay F-34 79

LATITUDE: 76° 13' 24" LONGITUDE: 108° 43' 47" STATUS: Abandoned

SPUD DATE: 8 Oct 1983 RIG RELEASE DATE: 1 May 1984 WELL DEPTH: 5437m

DRILL CAMP DIMENSIONS: 500 x 500m DRILLING WASTE SUMP DIMENSIONS: 122 x 30 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m ACCESS ROADS: 22 km

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not available at time of research

MISCELLANEOUS:

REFERENCES: EPS Land Use Application File NW 9761

WELL NAME: Panarctic et al Buckingham O-68 80

LATITUDE: 77° 08' 01" LONGITUDE: 91° 23' 38" STATUS: Abandoned

SPUD DATE: 17 Feb 1984 RIG RELEASE DATE: 14 May 1984 WELL DEPTH: 2772m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not available at time of research

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for Drilling Program Approval to Drill Panarctic et al Buckingham B-69 Offshore Buckingham Island Northwest Territories." 1983.